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Andrew D Magee

Michael D Howard, PWS

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AJ Jablonowski, PE

Samuel G Mygatt, LLB
1943-2010

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978 897 7100
FAX 978 897 0099

August 23, 2013

Nantucket Conservation Commission
2 Bathing Beach Road
Nantucket, MA 02554

Subject: Supplemental Submission for Baxter Road and Sconset Bluff Storm Damage Prevention Project NOI (SE 048-2581)

Dear Commissioners:

The project for this NOI has been downsized such that it now extends from Lot 63 to Lot 119 Baxter Road, Nantucket. The lots south of 63 have been dropped from this NOI submission as the coastal bank fronting these lots has not materially begun to erode. Revised plans are being submitted that reflect those changes.

The revised plans also reflect some design changes that have been made to provide a more rigorous revetment design with reduced coastal beach impact based on further review and additional coastal engineering input. The design changes include:

- revetment slope change to 2:1 which is more gradual than the earlier 1.5:1 and will result in much-reduced wave reflectance and hence reduced impact on the fronting beach,
- rip rap armor stone size has been increased,
- addition of bedding layer, and
- revetment toe size increased.

The coastal bank retreat rate has been updated with a new rate of 3.8 ft/yr (see attached Figure 1 and description in the attached "Responses to Questions from the Nantucket Conservation Commission asked at the August 8, 2013 hearing"). This has been accomplished using the new 2103 LIDAR survey and earlier aerials from 1994 to provide a longer timeframe for the retreat calculation. These updates produce a coastal bank sediment contribution of 12.0 cy/lf/yr.

Another change has to do with the project schedule. While we initially planned to begin the revetment construction this fall, it has become apparent that there is now insufficient time for that to happen. As such, we are modifying the project schedule with the plan now for all of the revetment work to be conducted during

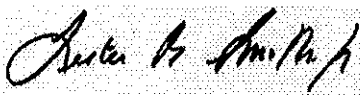
2014. SBPF is also in discussion with the Board of Selectmen regarding temporary protection for this winter for the most endangered sections of Baxter Road and threatened houses.

This change in project schedule will allow sufficient time for the betterment district to be established, which will preclude the need for an escrow fund since the betterment district will provide sufficient funding of sacrificial sand to ensure that the revetment will not harm downdrift beaches. Similarly, the betterment district will also provide sufficient funding to ensure that the revetment will be kept in good repair.

Please contact me at (978) 461-6212 or via email at lsmith@epsilonassociates.com for any questions regarding this submission.

Sincerely,

EPSILON ASSOCIATES, INC.



Lester B. Smith, Jr.
Principal and Coastal Geologist

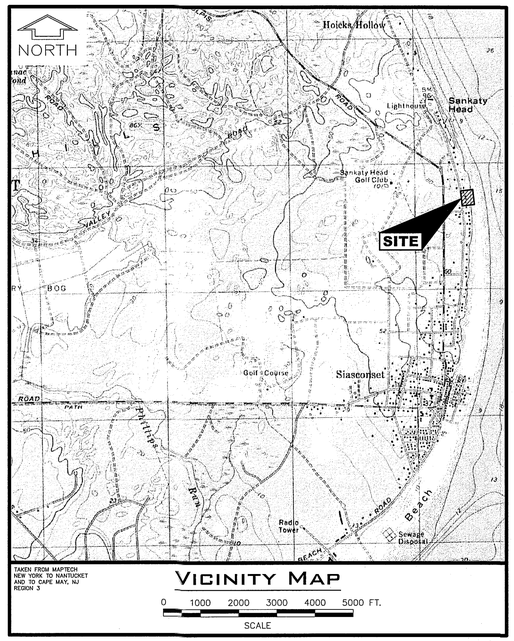
Enclosures

- Revised Engineering Plans (8/23/13)
- Figure 1. Coastal Bank Retreat
- Figure 2. Coastal Bank Sediment Contribution
- Responses to Questions from the Nantucket Conservation Commission asked at the August 8, 2013 hearing
- Responses to Comment Letter from Milone & MacBroom dated August 2, 2013
- Revised NOI Figure 1. USGS Locus
- Revised NOI Figure 2. Aerial Locus
- Revised NOI Figure 7. Wetland Resource Areas
- Revised NOI Figure 9. NHESP Estimated and Priority Habitat of Rare and Endangered Species Map

cc: DEP-Southeast Region, Jim Mahala
NHESP, Amy Conan

Sconset Beach Preservation Fund

Sconset Bluff Erosion Control Project
Notice of intent



Drawing List

Dwg. No.	Title	Rev. No.
210019.1-3-01	Cover Sheet and Drawing List	2
210019.1-3-02	Existing Site Plan - Sheet 1 of 4	1
210019.1-3-03	Existing Site Plan - Sheet 2 of 4	1
210019.1-3-04	Existing Site Plan - Sheet 3 of 4	1
210019.1-3-05	Existing Site Plan - Sheet 4 of 4	1
210019.1-3-06	Proposed Site Plan - Sheet 1 of 4	2
210019.1-3-07	Proposed Site Plan - Sheet 2 of 4	2
210019.1-3-08	Proposed Site Plan - Sheet 3 of 4	2
210019.1-3-09	Proposed Site Plan - Sheet 4 of 4	2
210019.1-3-10	Proposed Section A-A at Lot 115	1
210019.1-3-11	Proposed Section B-B at Lot 107	1
210019.1-3-12	Proposed Section C-C at Lot 97	2
210019.1-3-13	Proposed Section D-D at Lot 87	1
210019.1-3-14	Proposed Section E-E at Lot 83	2
210019.1-3-15	Proposed Section F-F at Lot 79	1
210019.1-3-16	Proposed Section G-G at Lot 65	2

For Permitting Purposes Only

REVISIONS		DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
	1	REVISED DRAWING LIST	8/14/13	BRJO			
	2	REVISED REVISION LIST	8/23/13	BRJO			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARRONE — No. 39432 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

COVER SHEET AND DRAWING LIST

SCALE AS NOTED | REVISION 2
DATE 6/28/13
DRAWING NO. 210019.1-3-01

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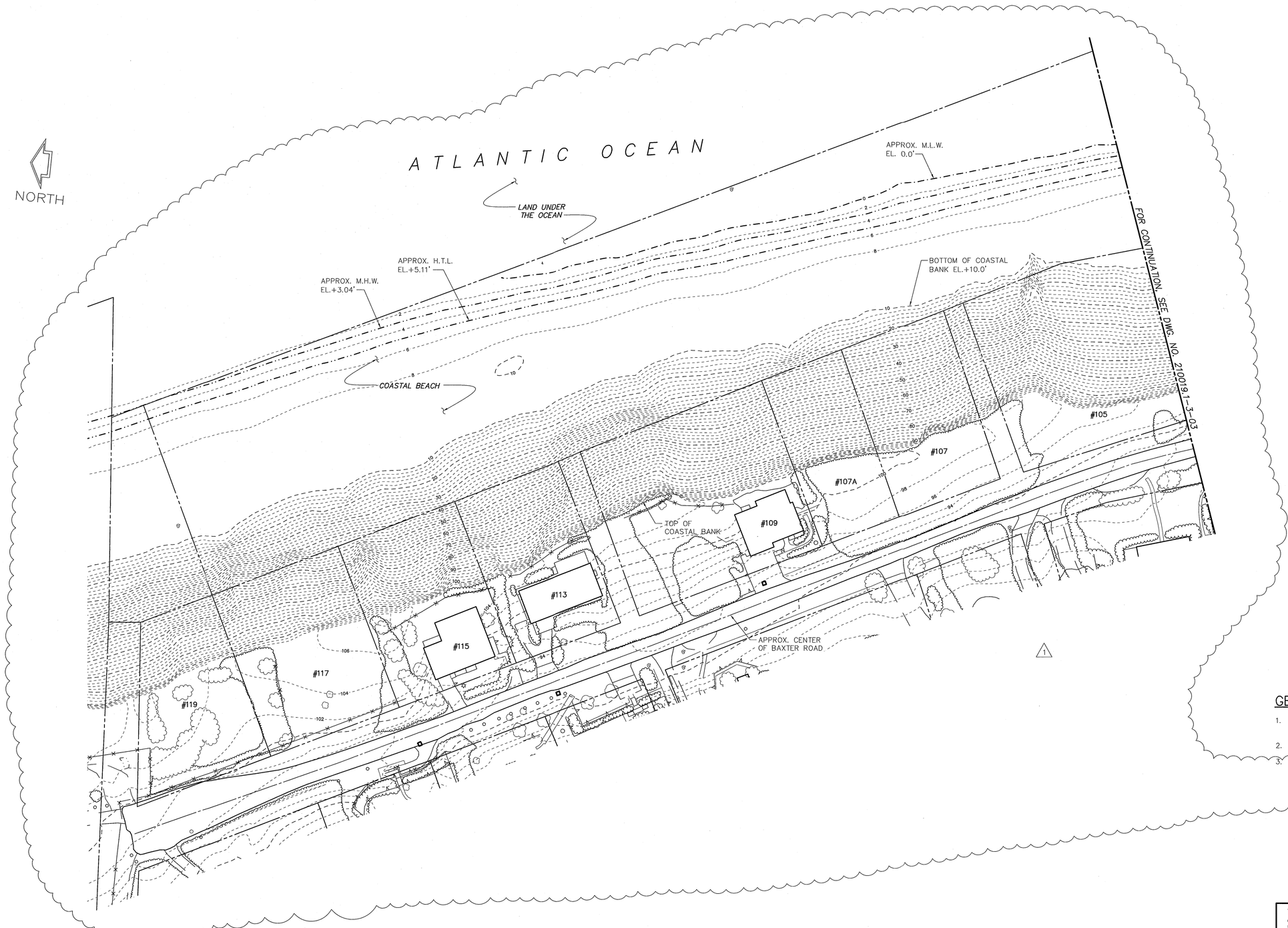

GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. CONTOURS SHOWN IN 2 FOOT INTERVALS.
3. TOPOGRAPHIC SURVEY INFORMATION SHOWN ON THIS PLAN TAKEN FROM A LIDAR SURVEY PROVIDED BY COL-EAST AND BLACKWELL & ASSOCIATES, INC. PERFORMED ON JULY 15, 2013 AND CAN ONLY REFLECT CONDITIONS AS THEY EXISTED AT THE TIME OF THE SURVEY.

GRAPHIC SCALES

CHECK GRAPHIC SCALES BEFORE USING

1"=40'-0" 0 40 80 FT.

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1	REVISED TOPOGRAPHIC SURVEY INFORMATION	8/14/13	BRJO			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS
JOSEPH F. MARRONE
STRUCTURAL
No. 39753
REGISTERED PROFESSIONAL ENGINEER

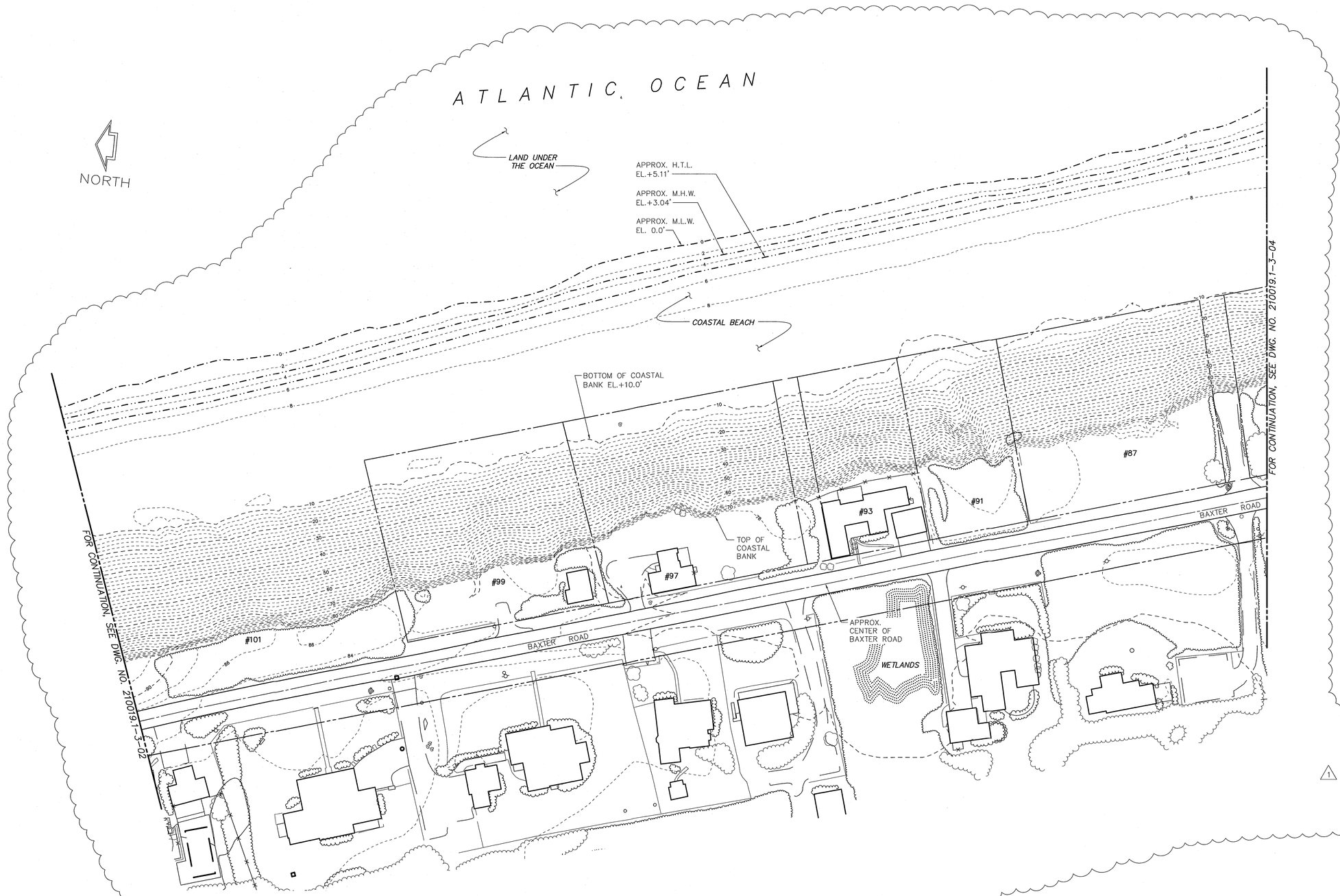
DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	BRJO

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

EXISTING SITE PLAN – SHEET 1 OF 4 (1)

SCALE AS NOTED | REVISION 1
DATE 6/28/13
DRAWING NO. 210019.1-3-02

P:\2010\OCC-210019.1\3_Project_Files\CAD\Task 3\02.dwg Dwg 02 Carrie L. Walter Wed, 14 Aug 2013 - 12:35pm



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GRAPHIC SCALES

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARRONE — STRUCTURAL No. 54730 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	BRJO

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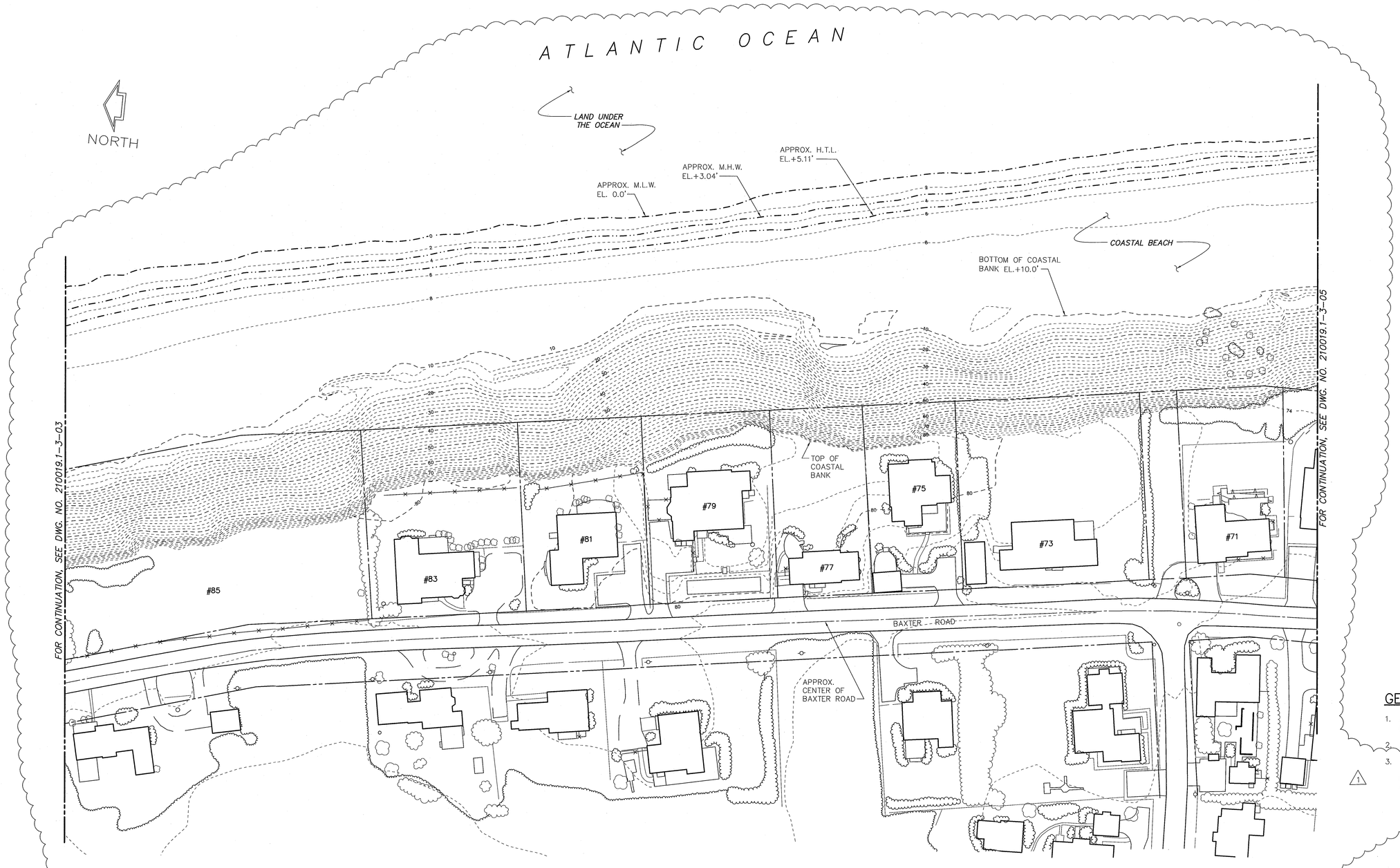
EXISTING SITE PLAN – SHEET 2 OF 4 (1)

SCALE AS NOTED | REVISION 1
DATE 6/28/13
DRAWING NO. 210019.1-3-03

P:\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\02.dwg Dwg 03 Carrie L. Walter Wed, 14 Aug 2013 - 12:35pm



GENERAL NOTES

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SCONSET BEACH
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18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS JOSEPH F. MATRONE STRUCTURAL No. 39783 REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	BRJO

SCONSET BLUFF EROSION CONTROL PROJECT
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EXISTING SITE PLAN – SHEET 3 OF 4 1

SCALE	REVISION
AS NOTED	1
DATE 6/28/13	

DRAWING NO.
210019.1-3-04

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NORTH

ATLANTIC OCEAN

APPROX. H.T.L. EL.+5.11'

APPROX. M.H.W. EL.+3.04'

APPROX. M.L.W. EL. 0.0'

LAND UNDER THE OCEAN

COASTAL BEACH

BOTTOM OF COASTAL BANK EL.+8.0'

VEGETATED BANK

FOOTPATH

TOP OF COASTAL BANK

FOR CONTINUATION, SEE DWG. NO. 210019.1-3-04

#69

#67

#65

#63

#61

#59

#55

BAXTER ROAD

PRIVATE WAY

FOOTPATH

GENERAL NOTES

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REVISIONS	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED TOPOGRAPHIC SURVEY INFORMATION	8/14/13	BRJO			

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SCONSET BEACH
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18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH T. MARRONE — STRUCTURAL — NO. 39725 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	BRJO

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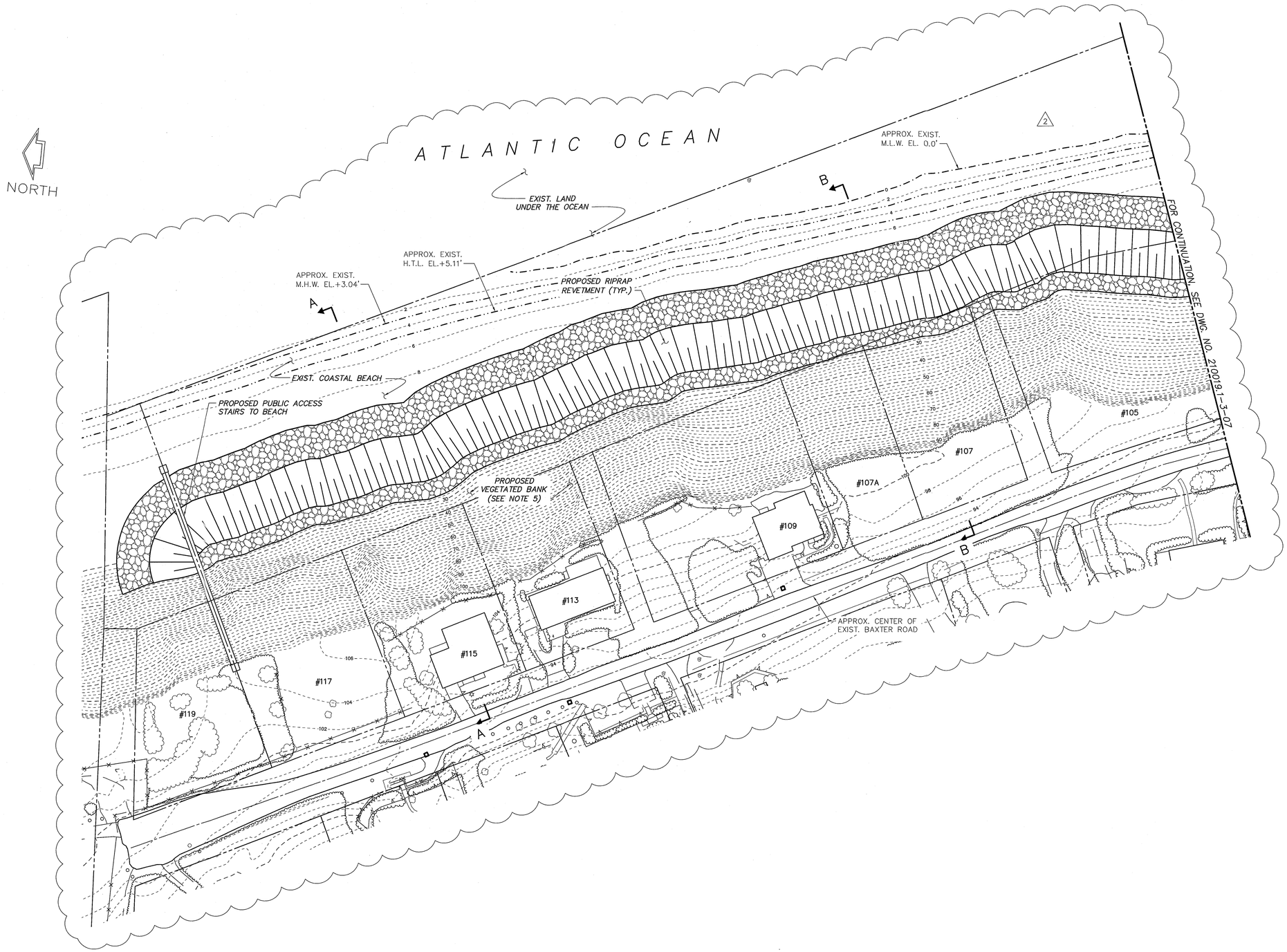

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4. SACRIFICIAL SAND COVER OVER THE REVETMENT NOT SHOWN FOR CLARITY. SEE PROPOSED SECTION A–A ON DWG. NO. 210019.1–3–10 AND PROPOSED SECTION B–B ON DWG. NO. 210019.1–3–11.
5. LIMITS OF THE PROPOSED RE–VEGETATION NOT SHOWN FOR CLARITY. REFER TO SECTION DRAWINGS ON DWG. NOS. 210019.1–3–10 THRU 16 FOR THE EXTENTS OF PROPOSED RE–VEGETATION.

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2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJO

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARRONE — STRUCTURAL No. 49735 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

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PROPOSED SITE PLAN – SHEET 1 OF 4

SCALE AS NOTED | REVISION 2
DATE 6/28/13
DRAWING NO. 210019.1–3–06

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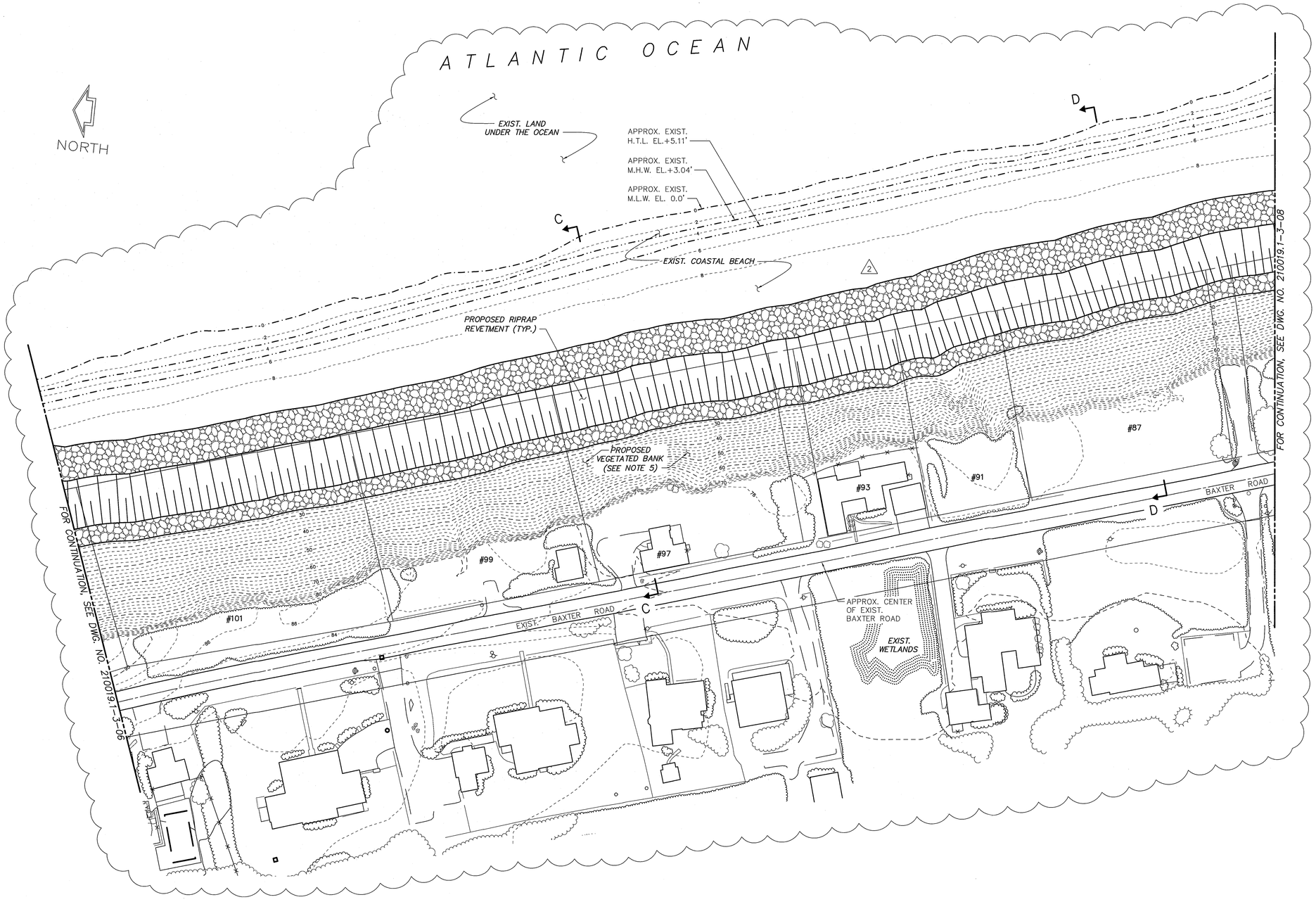

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4. SACRIFICIAL SAND COVER OVER THE REVETMENT NOT SHOWN FOR CLARITY. SEE PROPOSED SECTION C-C ON DWG. NO. 210019.1-3-12 AND PROPOSED SECTION D-D ON DWG. NO. 210019.1-3-13.
5. LIMITS OF THE PROPOSED RE-VEGETATION NOT SHOWN FOR CLARITY. REFER TO SECTION DRAWINGS ON DWG. NOS. 210019.1-3-10 THRU 16 FOR THE EXTENTS OF PROPOSED RE-VEGETATION.

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1	REVISED TOPOGRAPHIC SURVEY INFORMATION	8/14/13	BRJO
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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARFIONE — STRUCTURAL — No. 39124 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

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DRAWING NO. 210019.1-3-07

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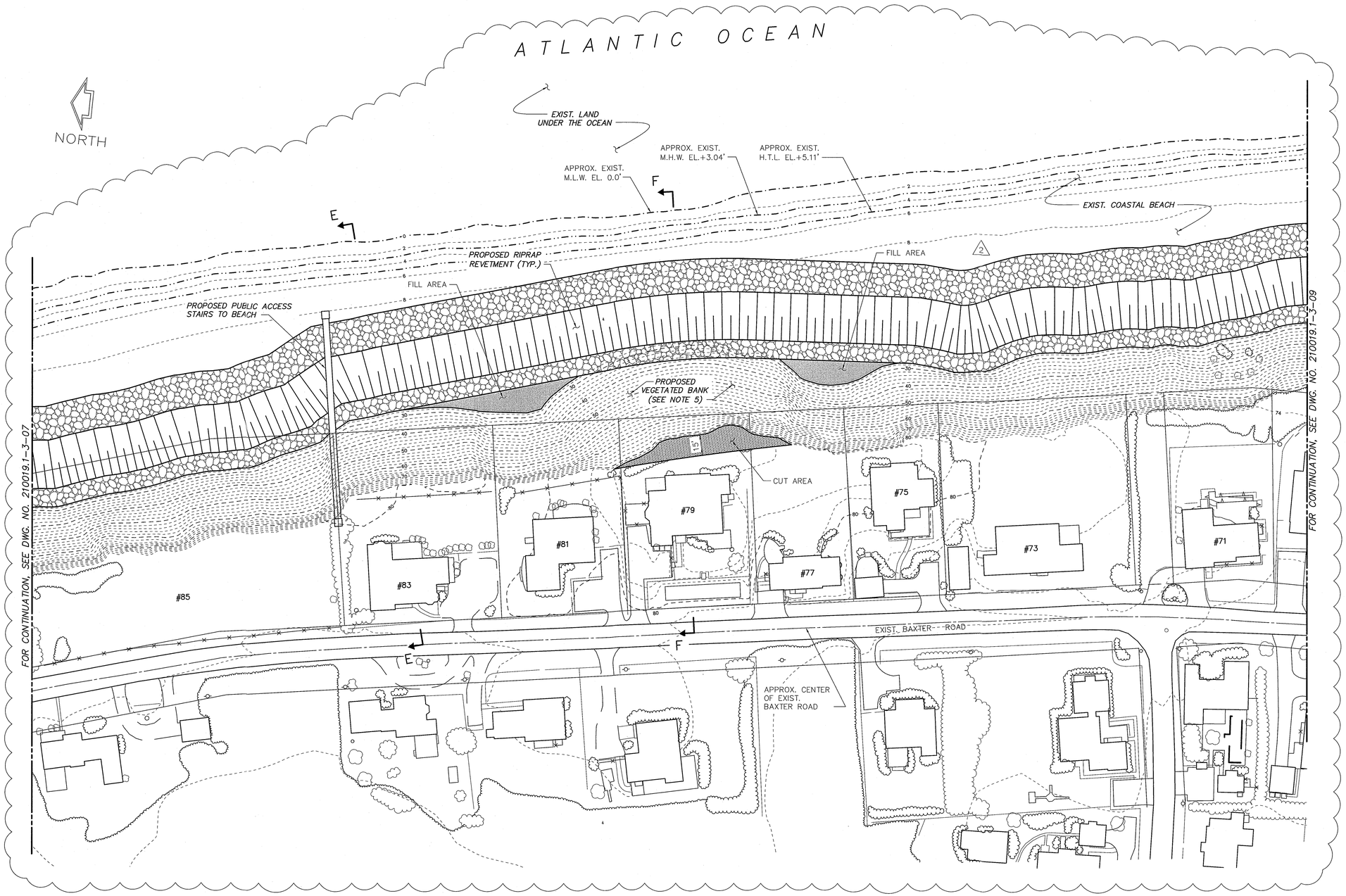

GENERAL NOTES

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5. LIMITS OF THE PROPOSED RE-VEGETATION NOT SHOWN FOR CLARITY. REFER TO SECTION DRAWINGS ON DWG. NOS. 210019.1-3-10 THRU 16 FOR THE EXTENTS OF PROPOSED RE-VEGETATION.

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	DESCRIPTION	DATE	BY
1	REVISED TOPOGRAPHIC SURVEY INFORMATION	8/14/13	BRJ0
2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

JOSEPH E. MARCHESE STRUCTURAL No. 39760 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
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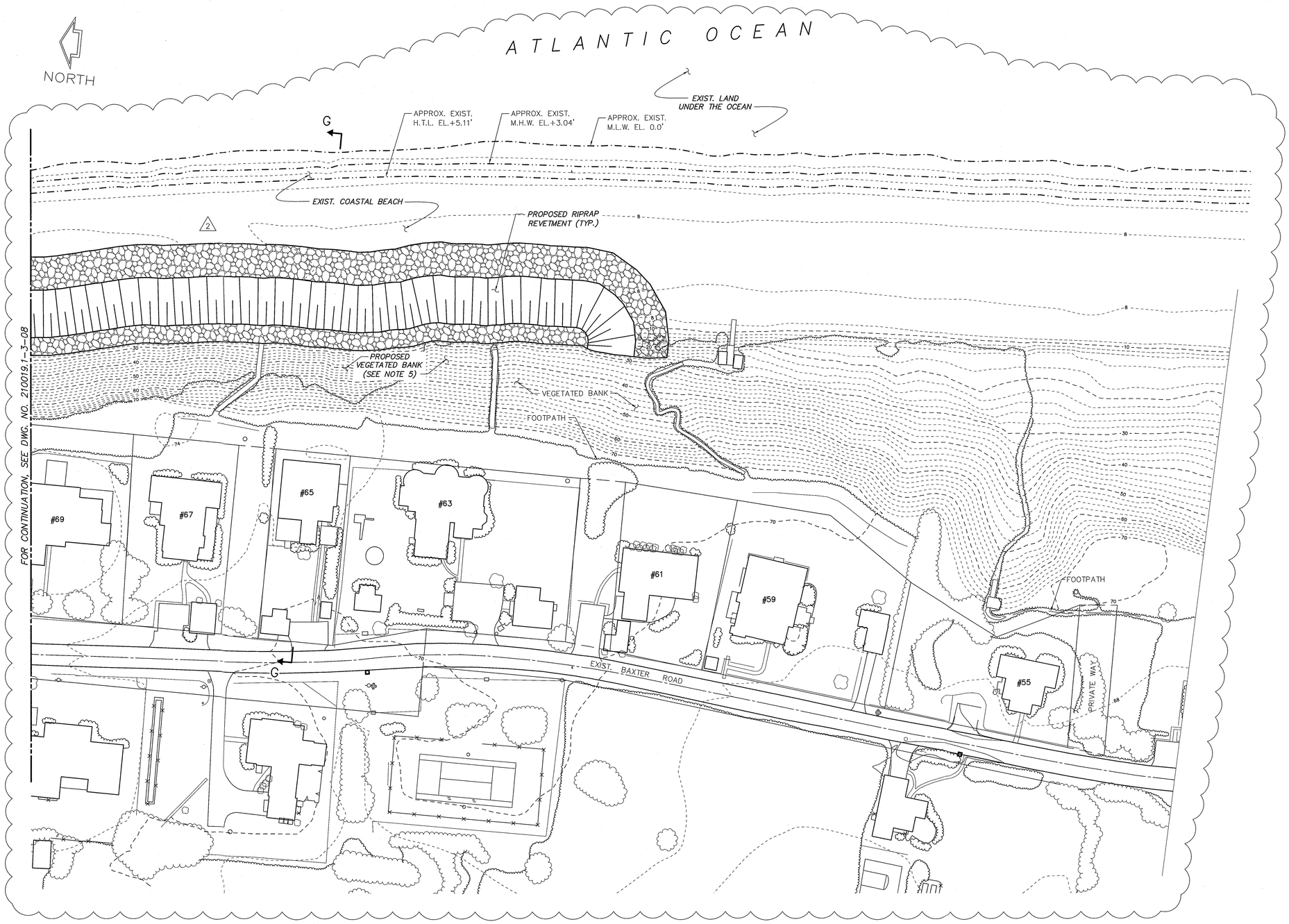
PROPOSED SITE PLAN – SHEET 3 OF 4

SCALE AS NOTED | REVISION 2
DATE 6/28/13
DRAWING NO. 210019.1-3-08



GENERAL NOTES

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4. SACRIFICIAL SAND COVER OVER THE REVETMENT NOT SHOWN FOR CLARITY. SEE PROPOSED SECTION G-G ON DWG. NO. 210019.1-3-16.
5. LIMITS OF THE PROPOSED RE-VEGETATION NOT SHOWN FOR CLARITY. REFER TO SECTION DRAWINGS ON DWG. NOS. 210019.1-3-10 THRU 16 FOR THE EXTENTS OF PROPOSED RE-VEGETATION.

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1"=40'-0" 0 40 80 FT.

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1	REVISED TOPOGRAPHIC SURVEY INFORMATION	8/14/13	BRJO
2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJO

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. LIA — MARINE STRUCTURAL — NO. 39758 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
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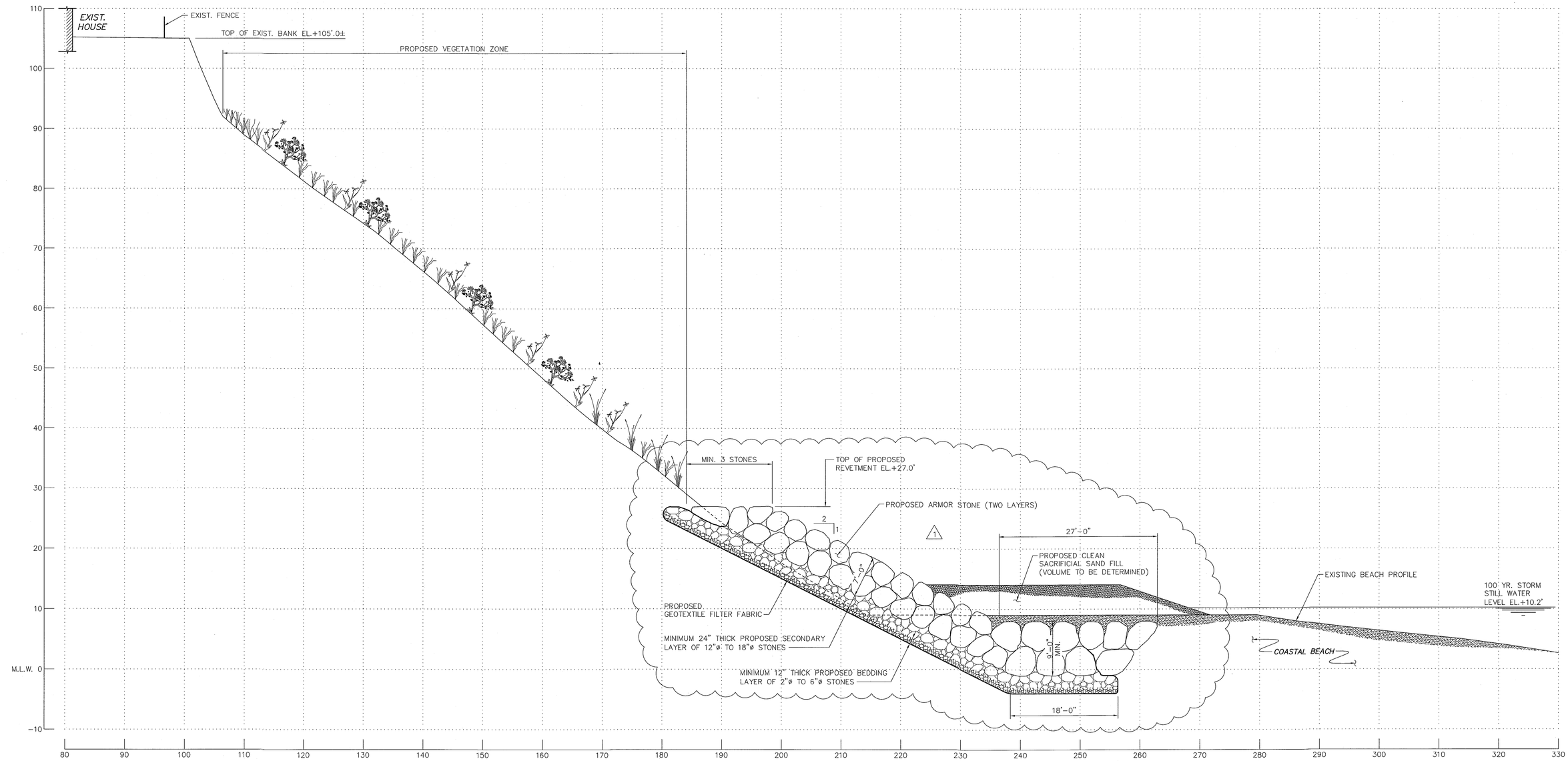
PROPOSED SITE PLAN – SHEET 4 OF 4

DRAWING NO. 210019.1-3-09

S:\OCC\Projects\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\06.dwg Dwg 09 Rey T. Bazeta Fri, 23 Aug 2013 - 11:57am



GEOTEXTILE FABRIC

1. GEOTEXTILE FABRIC SHALL BE MIRAFI FILTERWEAVE FW-700 GEOTEXTILE FABRIC OR AN EQUIVALENT ACCEPTED BY THE ENGINEER OF RECORD.
2. INSTALL GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MINIMUM 12 INCH LAP AT ADJACENT SECTIONS.
3. PROVIDE ADEQUATE SLACK IN FABRIC DURING INSTALLATION BY PROVIDING CONTINUOUS 12 INCH FOLDS AT 15 FOOT CENTERS PARALLEL TO THE SHORELINE.
4. PROPERLY ANCHOR FABRIC TO PREVENT SLIDING OR TEARING DURING INSTALLATION OF OVERBURDEN MATERIAL.

RIPRAP SHORE PROTECTION

1. STONE SHALL BE OF A QUALITY TO INSURE PERMANENCE OF THE STRUCTURE IN THE CLIMATE IN WHICH IT IS TO BE USED. THE STONE SHALL BE FREE FROM ORGANIC DEBRIS, DURABLE, SOUND, FREE FROM DETRIMENTAL CRACKS, SEAMS, AND OTHER DEFECTS WHICH TEND TO INCREASE DETERIORATION FROM NATURAL CAUSES OR CAUSE BREAKAGE IN HANDLING OR PLACEMENT. ORGANICS, SAND, CLAY, CHERT AND ROCK FINES ARE PROHIBITED. THE STONE SHALL BE SELECTED GRANITE, QUARTZITE, RHYOLITE, OR LIMESTONE.
2. FILTER LAYER BEDDING STONE SHALL BE 12 TO 18 INCH DIAMETER NOMINAL CRUSHED STONE.
3. RIPRAP ARMOR STONE SHALL CONFORM TO THE FOLLOWING GRADATION:

W_{MIN} = 3,850 LBS	D_{MIN} = 3.0 FT
W_{50} = 7,500 LBS	D_{50} = 3.5 FT
W_{MAX} = 15,400 LBS	D_{MAX} = 4.5 FT

4. ARMOR STONE SHALL HAVE A MINIMUM SIZE OF 36 INCHES MEASURING THE LEAST DIMENSION ACROSS ITS MIDSECTION.
5. STONES SHALL BE PLACED IN A MANNER TO PRODUCE A WELL GRADED MASS WITHOUT CAUSING DISPLACEMENT OF THE UNDERLYING MATERIAL. THE FINISHED SURFACE SHALL BE FREE FROM POCKETS OF SMALL STONES AND CLUSTERS OF LARGE STONES.

⚠1 SLOPE TREATMENT

1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
3. AFTER THE BEACH GRASS VEGETATION ACHIEVES A STABLE SLOPE, INDIGENOUS COASTAL WOODY VEGETATION WILL BE PLANTED ON THE SLOPE.
4. THE STEEPER SLOPE AT THE TOP OF THE COASTAL BANK (I.E. THE TOP 10-15 FEET) WILL BE KEPT FREE OF PLANTINGS TO PROVIDE NESTING HABITAT FOR BANK SWALLOWS.
5. THE SLOPE IMMEDIATELY ABOVE THE TOP OF THE PROPOSED REVETMENT WILL BE KEPT FREE OF VEGETATION (~5 FT) TO ALLOW SPACE/PASSAGE FOR CONSTRUCTION EQUIPMENT.

GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION A-A, SEE DWG. NO. 210019.1-3-06.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

1/8"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJO			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARRONE — STRUCTURAL No. 30758 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

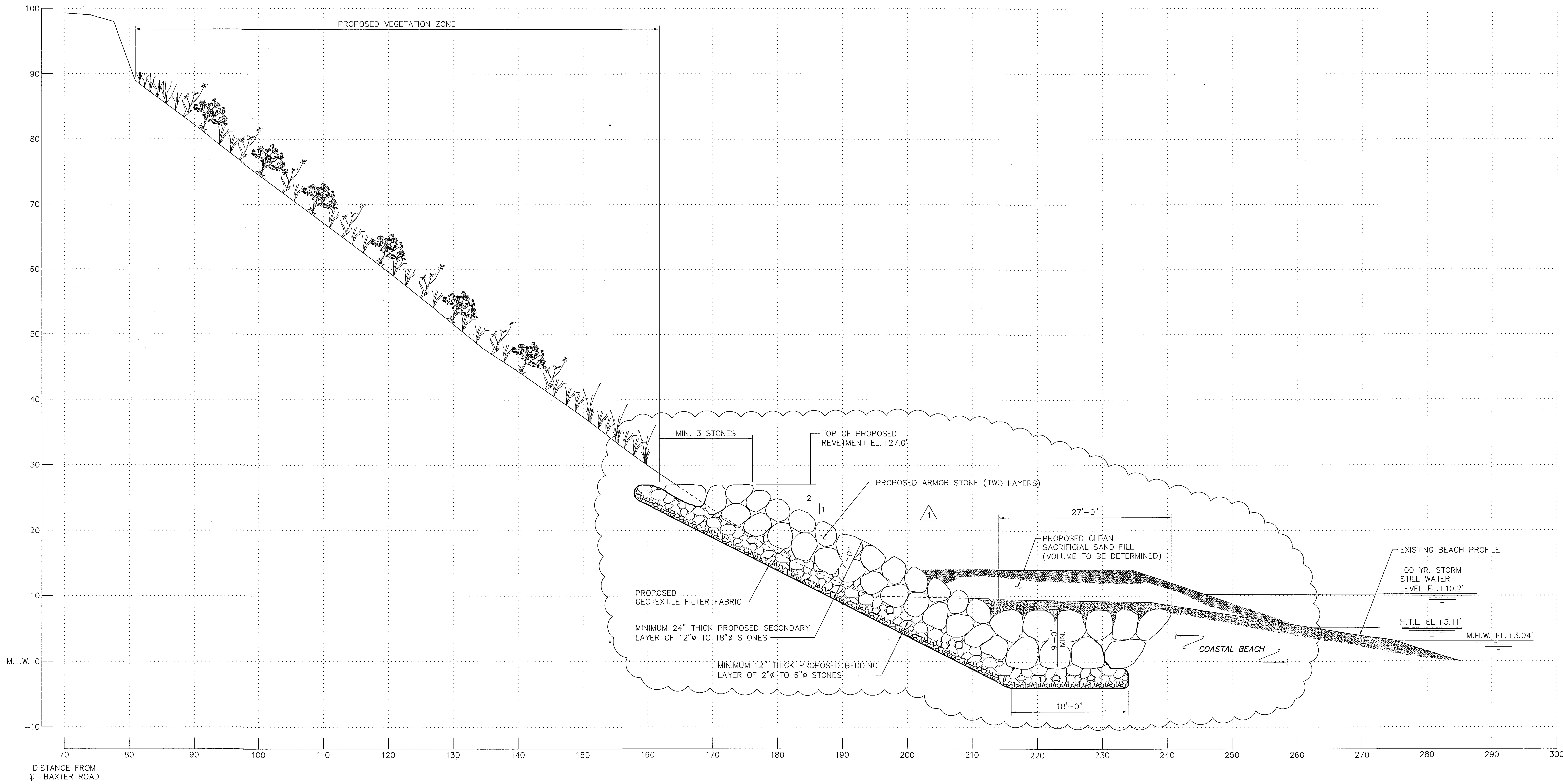
SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION A-A AT LOT 115

SCALE	REVISION
1/8"=1'-0"	1
DATE 8/11/13	

DRAWING NO. 210019.1-3-10

S:\OCC\Projects\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\10.dwg Dwg 10 Rey T. Bizeta Fri, 23 Aug 2013 - 4:15pm



GEOTEXTILE FABRIC

1. GEOTEXTILE FABRIC SHALL BE MIRAFI FILTERWEAVE FW-700 GEOTEXTILE FABRIC OR AN EQUIVALENT ACCEPTED BY THE ENGINEER OF RECORD.
2. INSTALL GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MINIMUM 12 INCH LAP AT ADJACENT SECTIONS.
3. PROVIDE ADEQUATE SLACK IN FABRIC DURING INSTALLATION BY PROVIDING CONTINUOUS 12 INCH FOLDS AT 15 FOOT CENTERS PARALLEL TO THE SHORELINE.
4. PROPERLY ANCHOR FABRIC TO PREVENT SLIDING OR TEARING DURING INSTALLATION OF OVERBURDEN MATERIAL.

RIPRAP SHORE PROTECTION

1. STONE SHALL BE OF A QUALITY TO INSURE PERMANENCE OF THE STRUCTURE IN THE CLIMATE IN WHICH IT IS TO BE USED. THE STONE SHALL BE FREE FROM ORGANIC DEBRIS, DURABLE, SOUND, FREE FROM DETRIMENTAL CRACKS, SEAMS, AND OTHER DEFECTS WHICH TEND TO INCREASE DETERIORATION FROM NATURAL CAUSES OR CAUSE BREAKAGE IN HANDLING OR PLACEMENT. ORGANICS, SAND, CLAY, CHERT AND ROCK FINES ARE PROHIBITED. THE STONE SHALL BE SELECTED GRANITE, QUARTZITE, RHYOLITE, OR LIMESTONE.
2. FILTER LAYER BEDDING STONE SHALL BE 12 TO 18 INCH DIAMETER NOMINAL CRUSHED STONE.
3. RIPRAP ARMOR STONE SHALL CONFORM TO THE FOLLOWING GRADATION: (1)

   W_{MIN} = 3,850 LBS — D_{MIN} = 3.0 FT
   W_{50} = 7,500 LBS — D_{50} = 3.5 FT
   W_{MAX} = 15,400 LBS — D_{MAX} = 4.5 FT

4. ARMOR STONE SHALL HAVE A MINIMUM SIZE OF 36 INCHES MEASURING THE LEAST DIMENSION ACROSS ITS MIDSECTION.
5. STONES SHALL BE PLACED IN A MANNER TO PRODUCE A WELL GRADED MASS WITHOUT CAUSING DISPLACEMENT OF THE UNDERLYING MATERIAL. THE FINISHED SURFACE SHALL BE FREE FROM POCKETS OF SMALL STONES AND CLUSTERS OF LARGE STONES.

(1) SLOPE TREATMENT

1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
3. AFTER THE BEACH GRASS VEGETATION ACHIEVES A STABLE SLOPE, INDIGENOUS COASTAL WOODY VEGETATION WILL BE PLANTED ON THE SLOPE.
4. THE STEEPER SLOPE AT THE TOP OF THE COASTAL BANK (I.E. THE TOP 10-15 FEET) WILL BE KEPT FREE OF PLANTINGS TO PROVIDE NESTING HABITAT FOR BANK SWALLOWS.
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GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION B-B, SEE DWG. NO. 210019.1-3-06.

GRAPHIC SCALES

CHECK GRAPHIC SCALES BEFORE USING

1/8"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJO			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH H. MARRONE — STRUCTURAL — No. 38733 — REGISTERED PROFESSIONAL ENGINEER

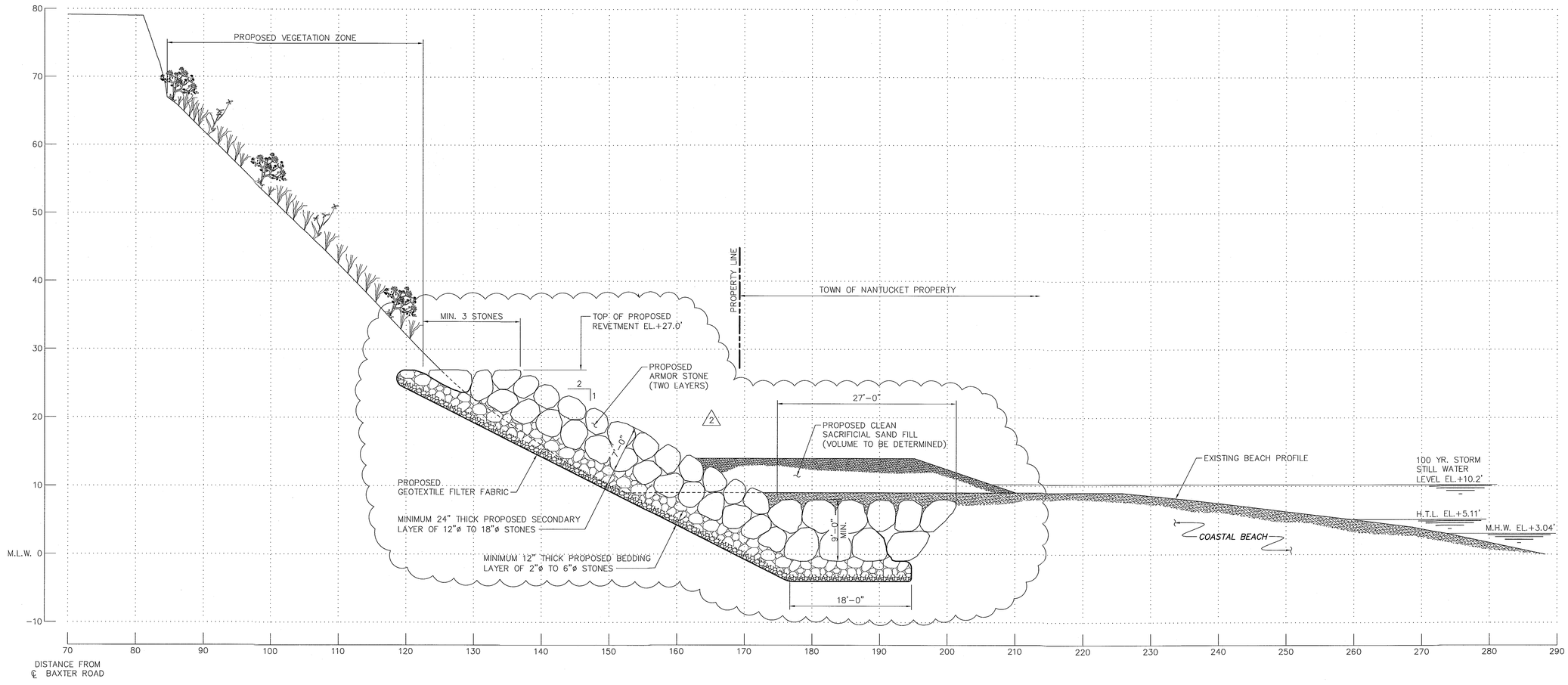
DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION B-B AT LOT 107

SCALE	REVISION
1/8"=1'-0"	1
DATE 8/11/13	

DRAWING NO. 210019.1-3-11



GEOTEXTILE FABRIC

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RIPRAP SHORE PROTECTION

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2 SLOPE TREATMENT

1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
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GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION C-C, SEE DWG. NO. 210019.1-3-07.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

1/8"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SECTION	8/14/13	BRJ0			
2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH MARRONE — STRUCTURAL — No. 39754 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION C-C AT LOT 97

SCALE 1/8"=1'-0" | DATE 6/28/13 | REVISION 2

DRAWING NO. 210019.1-3-12

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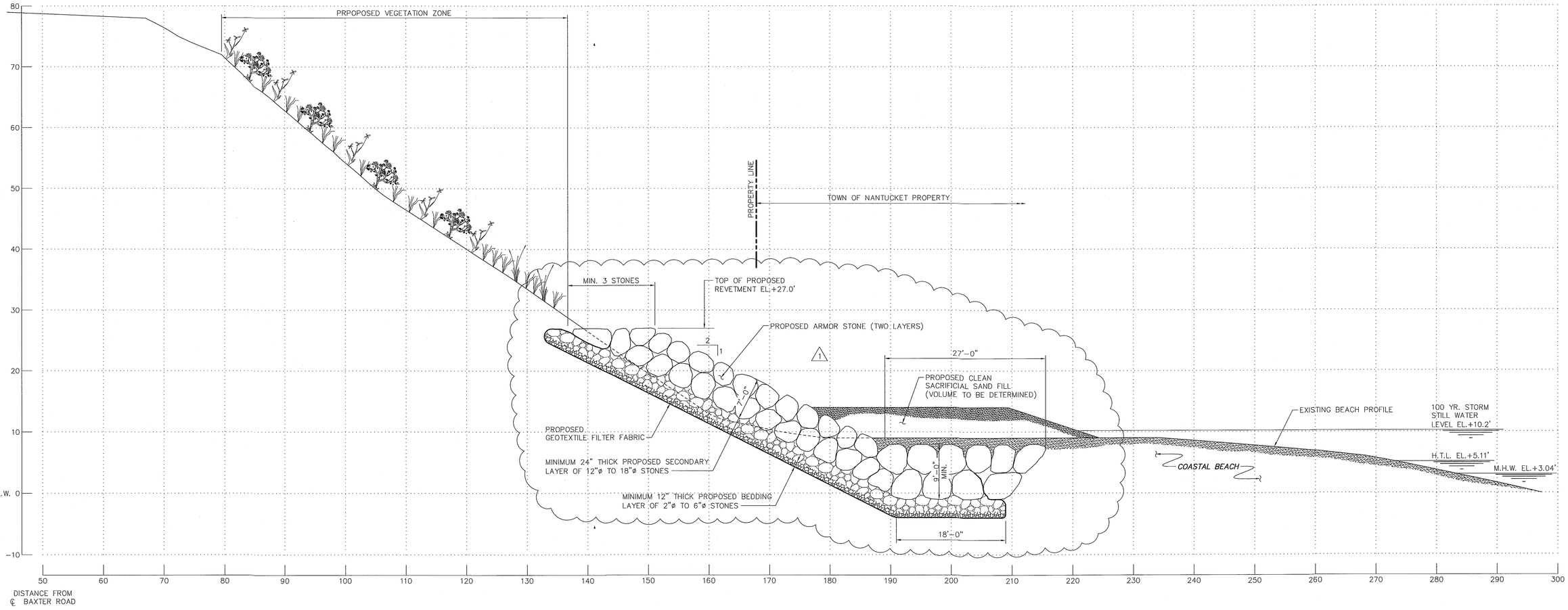

GEOTEXTILE FABRIC

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2. INSTALL GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MINIMUM 12 INCH LAP AT ADJACENT SECTIONS.
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RIPRAP SHORE PROTECTION

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1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
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GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION D-D, SEE DWG. NO. 210019.1-3-07.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

1/8"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0			

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SCONSET BEACH
PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS
JOSEPH F. MARRONE
No. 39931
REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION D-D AT LOT 87

SCALE	REVISION
1/8"=1'-0"	1
DATE 8/11/13	

DRAWING NO.
210019.1-3-13

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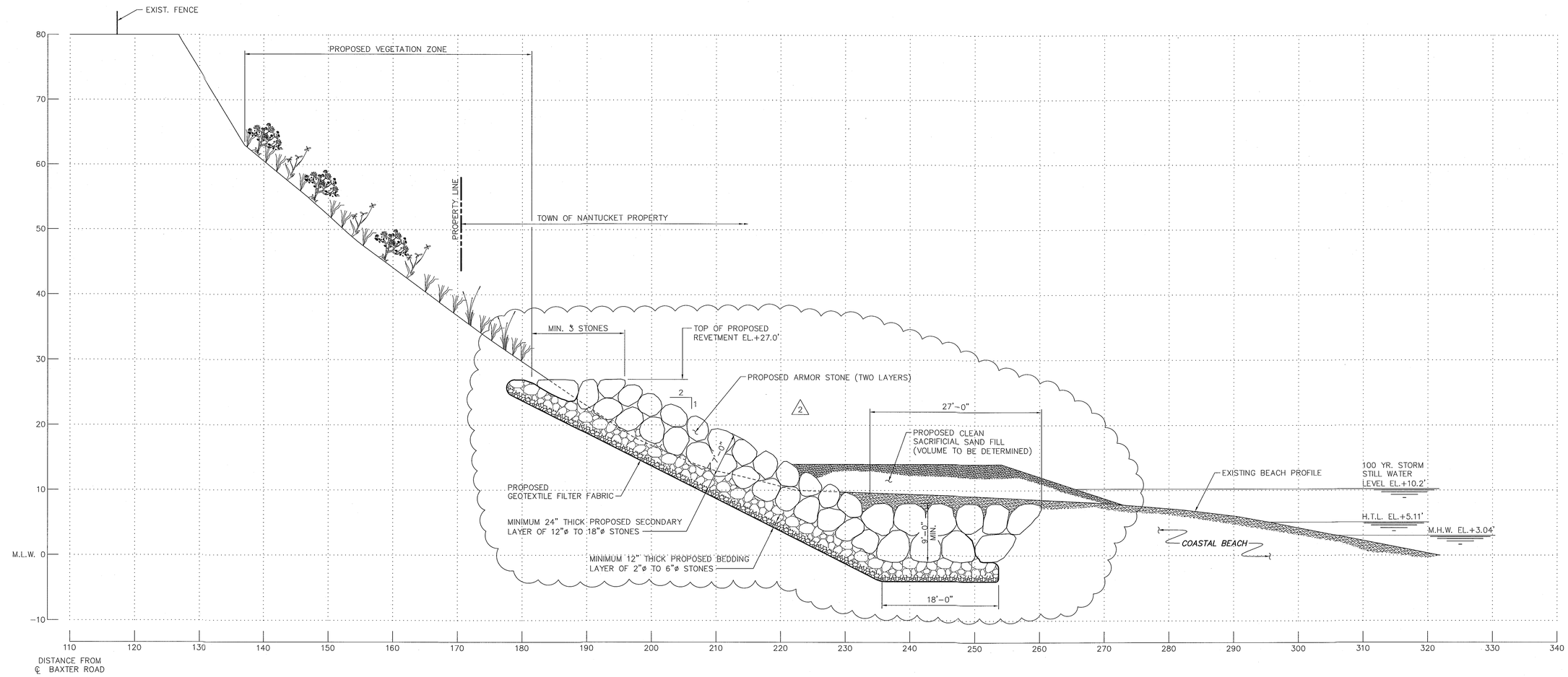

GEOTEXTILE FABRIC

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2 SLOPE TREATMENT

1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
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GENERAL NOTES

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2. FOR LOCATION OF SECTION E-E, SEE DWG. NO. 210019.1-3-08.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

⅛"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SECTION	8/14/13	BRJ0			
2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0			

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SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH F. MARRONE — STRUCTURAL — No. 39128 — REGISTERED PROFESSIONAL ENGINEER

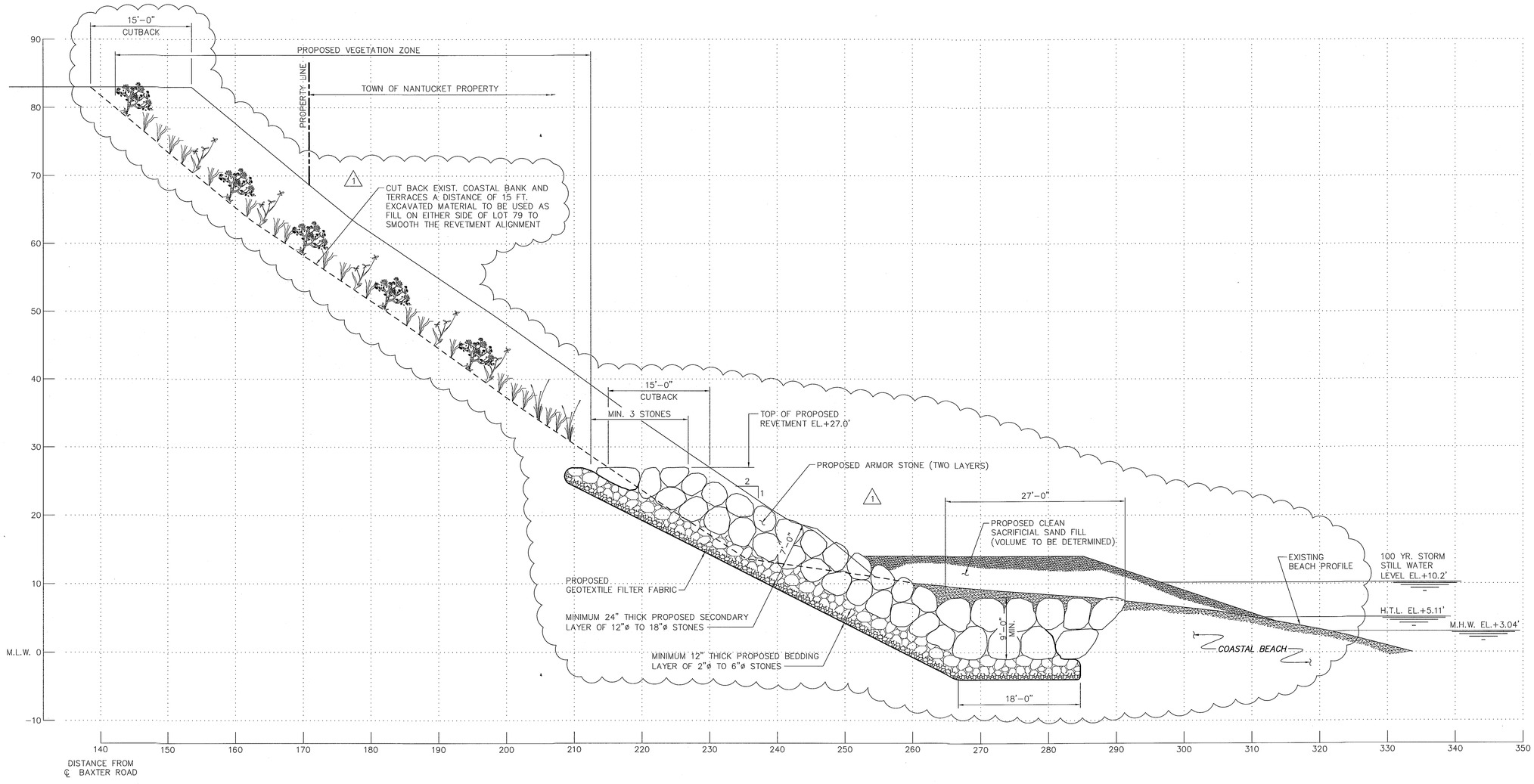
DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION E-E AT LOT 83

SCALE 1/8"=1'-0" | REVISION 2
DATE 6/28/13
DRAWING NO. 210019.1-3-14

S:\OCC\Projects\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\10.dwg Dwg 14 Roy T. Buzeta Fri, 23 Aug 2013 - 4:09pm



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1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
3. AFTER THE BEACH GRASS VEGETATION ACHIEVES A STABLE SLOPE, INDIGENOUS COASTAL WOODY VEGETATION WILL BE PLANTED ON THE SLOPE.
4. THE STEEPER SLOPE AT THE TOP OF THE COASTAL BANK (I.E. THE TOP 10-15 FEET) WILL BE KEPT FREE OF PLANTINGS TO PROVIDE NESTING HABITAT FOR BANK SWALLOWS.
5. THE SLOPE IMMEDIATELY ABOVE THE TOP OF THE PROPOSED REVETMENT WILL BE KEPT FREE OF VEGETATION (~5 FT) TO ALLOW SPACE/PASSAGE FOR CONSTRUCTION EQUIPMENT.

GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION F-F, SEE DWG. NO. 210019.1-3-08.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

⅛"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY
1	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0

Ocean and Coastal Consultants | COWI
Ocean and Coastal Consultants, Inc.
475 School Street, Unit 9, Marshfield, MA 02050
Phone: (508) 830-1110 Fax: (781) 834-4635
Visit us at www.ocean-coastal.com

SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS JOSEPH F. MAHONE STRUCTURAL NO. 50753 REGISTERED PROFESSIONAL ENGINEER

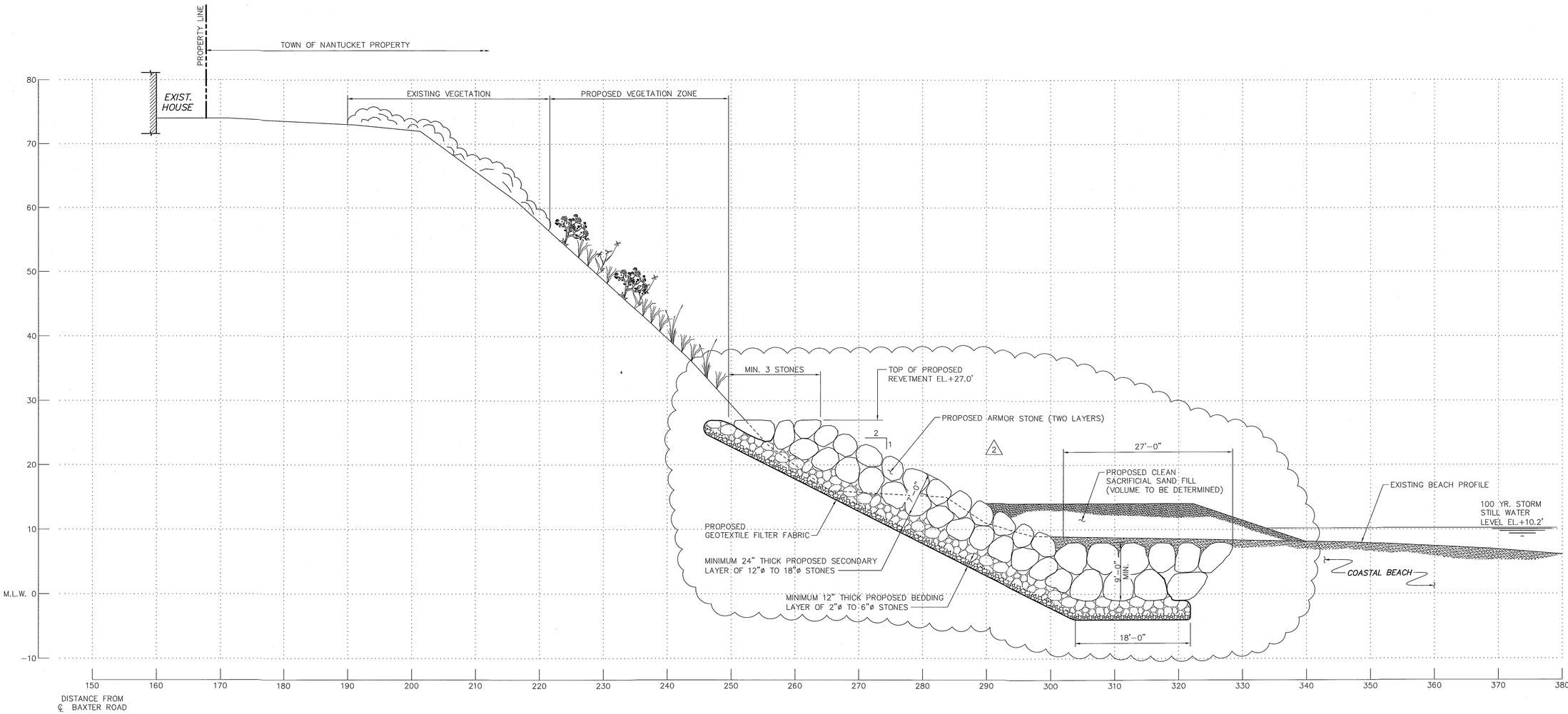
DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION F-F AT LOT 79

SCALE 1/8"=1'-0" | REVISION 1
DATE 8/11/13
DRAWING NO. 210019.1-3-15

S:\OCC\Projects\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\10.dwg Dwg 15 Rey T. Buzeta Fri, 23 Aug 2013 - 4:08pm



GEOTEXTILE FABRIC

1. GEOTEXTILE FABRIC SHALL BE MIRAFI FILTERWEAVE FW-700 GEOTEXTILE FABRIC OR AN EQUIVALENT ACCEPTED BY THE ENGINEER OF RECORD.
2. INSTALL GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MINIMUM 12 INCH LAP AT ADJACENT SECTIONS.
3. PROVIDE ADEQUATE SLACK IN FABRIC DURING INSTALLATION BY PROVIDING CONTINUOUS 12 INCH FOLDS AT 15 FOOT CENTERS PARALLEL TO THE SHORELINE.
4. PROPERLY ANCHOR FABRIC TO PREVENT SLIDING OR TEARING DURING INSTALLATION OF OVERBURDEN MATERIAL.

RIPRAP SHORE PROTECTION

1. STONE SHALL BE OF A QUALITY TO INSURE PERMANENCE OF THE STRUCTURE IN THE CLIMATE IN WHICH IT IS TO BE USED. THE STONE SHALL BE FREE FROM ORGANIC DEBRIS, DURABLE, SOUND, FREE FROM DETRIMENTAL CRACKS, SEAMS, AND OTHER DEFECTS WHICH TEND TO INCREASE DETERIORATION FROM NATURAL CAUSES OR CAUSE BREAKAGE IN HANDLING OR PLACEMENT. ORGANICS, SAND, CLAY, CHERT AND ROCK FINES ARE PROHIBITED. THE STONE SHALL BE SELECTED GRANITE, QUARTZITE, RHYOLITE, OR LIMESTONE.
2. FILTER LAYER BEDDING STONE SHALL BE 12 TO 18 INCH DIAMETER NOMINAL CRUSHED STONE.
3. RIPRAP ARMOR STONE SHALL CONFORM TO THE FOLLOWING GRADATION:

W_{MIN} = 3,850 LBS	D_{MIN} = 3.0 FT
W_{50} = 7,500 LBS	D_{50} = 3.5 FT
W_{MAX} = 15,400 LBS	D_{MAX} = 4.5 FT

4. ARMOR STONE SHALL HAVE A MINIMUM SIZE OF 36 INCHES MEASURING THE LEAST DIMENSION ACROSS ITS MIDSECTION.
5. STONES SHALL BE PLACED IN A MANNER TO PRODUCE A WELL GRADED MASS WITHOUT CAUSING DISPLACEMENT OF THE UNDERLYING MATERIAL. THE FINISHED SURFACE SHALL BE FREE FROM POCKETS OF SMALL STONES AND CLUSTERS OF LARGE STONES.

⚠2 SLOPE TREATMENT

1. BARE AREAS ON THE UPPER BANK SLOPE WILL BE STABILIZED WITH JUTE FABRIC PINNED TO THE BANK SURFACE.
2. BEACH GRASS VEGETATION WILL BE PLANTED THROUGH HOLES IN THE JUTE FABRIC.
3. AFTER THE BEACH GRASS VEGETATION ACHIEVES A STABLE SLOPE, INDIGENOUS COASTAL WOODY VEGETATION WILL BE PLANTED ON THE SLOPE.
4. THE STEEPER SLOPE AT THE TOP OF THE COASTAL BANK (I.E. THE TOP 10-15 FEET) WILL BE KEPT FREE OF PLANTINGS TO PROVIDE NESTING HABITAT FOR BANK SWALLOWS.
5. THE SLOPE IMMEDIATELY ABOVE THE TOP OF THE PROPOSED REVETMENT WILL BE KEPT FREE OF VEGETATION (~5 FT) TO ALLOW SPACE/PASSAGE FOR CONSTRUCTION EQUIPMENT.

GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').
2. FOR LOCATION OF SECTION G-G, SEE DWG. NO. 210019.1-3-09.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

⅛"=1'-0" 0 5 10 15 FT.

FOR PERMITTING PURPOSES ONLY

REVISIONS

	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY
1	REVISED SECTION	8/14/13	BRJ0			
2	REVISED SLOPE PROTECTION DESIGN	8/23/13	BRJ0			

Ocean and Coastal Consultants | COWI
Ocean and Coastal Consultants, Inc.
475 School Street, Unit 9, Marshfield, MA 02050
Phone: (508) 830-1110 Fax: (781) 834-4635
Visit us at www.ocean-coastal.com

SCONSET BEACH PRESERVATION FUND
18 Sesapana Road, Nantucket, MA 02554

COMMONWEALTH OF MASSACHUSETTS — JOSEPH E. MARSCHNER — STRUCTURAL — No. 52753 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY:	ADKA
DRAWN BY:	CAMA
CHECKED BY:	AZSL
QC REVIEW:	JOMA

SCONSET BLUFF EROSION CONTROL PROJECT
NOTICE OF INTENT

PROPOSED SECTION G-G AT LOT 65

SCALE 1/8"=1'-0" | DATE 6/28/13 | REVISION 2

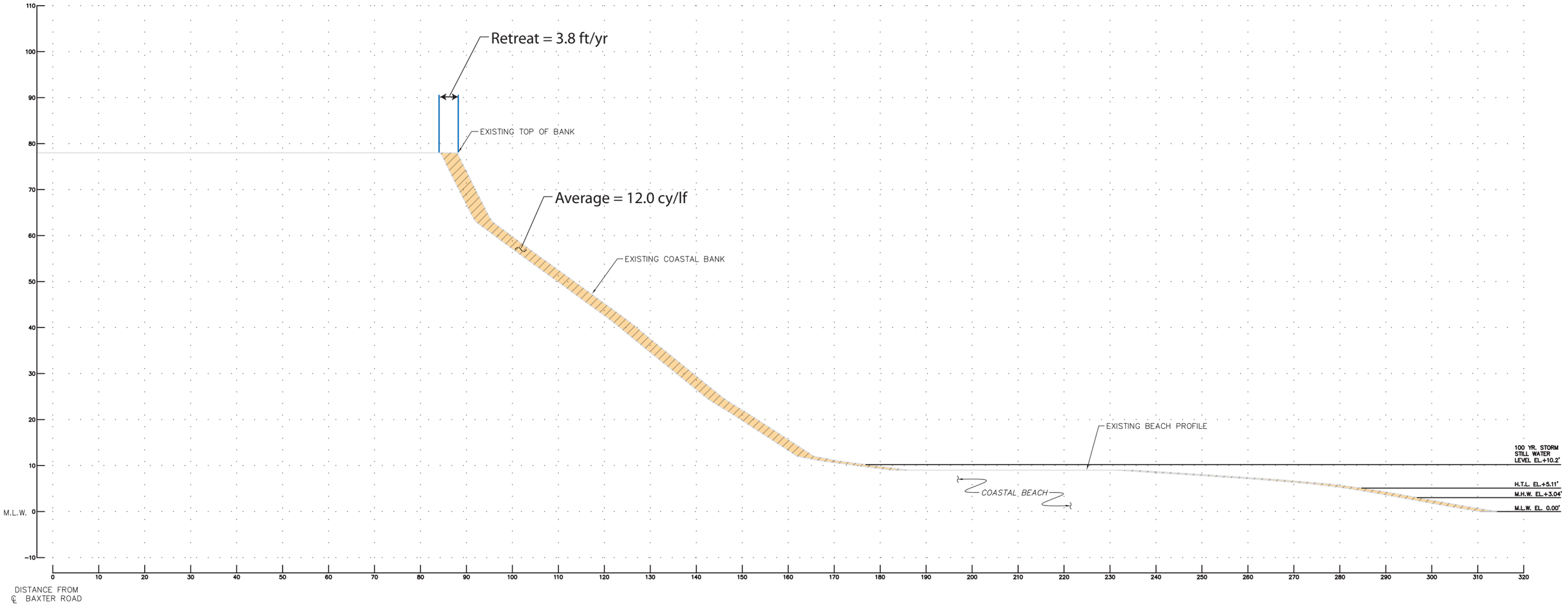
DRAWING NO. 210019.1-3-16

S:\OCC\Projects\2010\OCC_210019.1\3_Project_Files\CAD\Task 3\10.dwg Dwg 16 Rey T. Buzeta Fri, 23 Aug 2013 - 4:06pm

G:\Projects\Lighthouse\2013\ConCom\Retreat\Revised\retreat_lots_71-119v2.mxd

Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, MA

Figure 1
Coastal Bank Retreat



GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=0.0').

Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, Massachusetts

Epsilon ASSOCIATES INC.

Figure 2

Coastal Bank Sediment Contribution – Representative Profile (85 Baxter Road)

BAXTER ROAD AND SCONSET BLUFF STORM DAMAGE PREVENTION PROJECT
NOTICE OF INTENT (DEP FILE NO. SE 048-2581)

SUPPLEMENTAL RESPONSES TO QUESTIONS FROM NANTUCKET CONSERVATION COMMISSION ASKED AT PUBLIC HEARING ON AUGUST 8, 2013

August 23, 2013

To assist the Commission and the public with the review of the NOI, SBPF is presenting this supplemental submission with additional responses to the topics that were covered at the public hearing on August 8, 2013. The format of this document is to present a brief summary of each comment or question in bold followed by a response in regular text.

QUESTIONS/COMMENTS FROM CONSERVATION COMMISSION MEMBERS

I. DESIGN

Will the revetment settle and become destabilized?

OCC prepared a Plaxis model to estimate the stability and settlement of the revetment following installation on the lower coastal bank. The model indicates that the maximum vertical settlement would be approximately 6 inches, which is negligible compared to the amount of sand removed and revetment stone placed and would therefore not adversely affect the function or stability of the revetment. Since the native beach and bank sediments are cohesionless, most of the settlement would occur as the revetment material is initially being placed. OCC modeled the revetment with and without the sacrificial sand berm present over the rock toe. There was no significant difference in the results for either of the models.

Provide an updated bank contribution volume using the 2013 LIDAR data.

The bank retreat calculations have been updated using the 2013 LIDAR data and using georeferenced aerial photographs dating back to 1994 to establish a long-term bank retreat average.

- **Bank Retreat Rate.** The top of the coastal bank was digitized for 1994, 2003, and 2013 using ESRI ArcGIS software to produce the attached figure (see Figure 1). Top of coastal bank retreat was analyzed along shore-perpendicular transects spaced approximately every 20 feet.
    - For the portions of the project area from 91-119 Baxter Road, the top of coastal bank was actively retreating as early as 1994. For these lots, a long-term (1994-2013) coastal bank retreat rate of **3.2 feet/yr** was calculated.

- For the portions of the project area from 71-91 Baxter Road, the top of coastal bank was not actively retreating in 1994 (Figure 1 shows that the 1994 and 2003 top of bank lines are coincident south of 91 Baxter Road). For these lots, a 10-year (2003-2013) bank retreat rate of **4.5 feet/yr** was calculated. (Note: 79 Baxter Road was excluded from these calculations due to the presence of the terraces during much of this time period.)

- For the entire Project area, a single average coastal bank retreat rate was calculated by averaging the above two rates (weighted as to the length of the Project associated with each rate), yielding **3.8 ft/yr**.

- **Volume Calculation**: Section views from each of the Project lots from 63-119 Baxter Road were developed from the 2013 LIDAR survey. The volume associated with a bank retreat of 3.8 ft/yr was then determined for each lot using AutoCAD (see typical Figure 2). An average volume for all the project lots was then determined, yielding **12.0 cubic yards/linear foot/year (cy/lf/yr).**

This calculation, based on LIDAR data and aerial photography, was corroborated by independent calculations performed by Woods Hole Group (WHG) and Coastal Planning and Engineering (CP&E). The WHG calculation was performed in August 2013 and relied upon the most recent beach profile survey data and top and bottom of bluff measurements; the CP&E sediment budget was prepared for the beach nourishment project and relied upon beach profile survey data from 1995-2005. The WHG and CP&E bank contribution volumes were both within approximately 10% of the bank contribution volume of **12.0 cy/lf/yr**, providing a high level of confidence in the proposed sediment mitigation volume. (See also the response to the following question.)

The long-term bank retreat rate was also compared to long-term shoreline change rate. To ensure a valid comparison, we compared the same locations to the same timeframes. As shoreline change data are available from 1994-2013, we compared the 1994-2013 bank retreat rate from 91-119 Baxter Road (3.2 ft/yr) to the 1994-2013 shoreline change rate for those profiles located nearest to 91-119 Baxter Road (3.1 ft/yr). The similarity between these two numbers (3.2 ft/yr for bank retreat rate and 3.1 ft/yr for shoreline change rate) supports the accuracy of the calculated bank retreat rate. Comparisons between 1994-2013 shoreline change rates and bank retreat rates were not made for areas farther south of 91 Baxter Road, since the coastal bank was not actively retreating throughout this time period.

What is the sediment budget for this area?

The rate and direction of sediment transport within the Project area are highly variable. There is evidence of bi-directional longshore sand transport, with gross transport exceeding the net transport. The direction of sand transport also varies depending upon the combined influence of storms, prevailing wind waves, and tidal currents due to the differing tidal regimes on the south and

east sides of the island that converge in the Project vicinity. The offshore system of shoals evolves as well, which affects beach sediment transport.

As previously mentioned, the Project team calculated beach and bluff volume change based using a variety of data sources, including beach profile survey data, top and bottom of bluff measurements, LiDAR data, and aerial photography. The bluff contribution to the sediment budget was estimated by three independent methods, all of which produced an estimate within approximately 10%. Thus, there is a high level of confidence in the estimated sand volume provided to the littoral system by the bluff in the proposal Project area. Including a sand volume proportional to this erosion rate as part of the Project for mitigation is intended to offset potential project impacts to the overall littoral system. Due to the complexities of the littoral system, it is recommended to place the mitigation sand near the proposed Project. The purpose of the proposed mitigation sand, then, is to allow the variable prevailing natural processes to distribute the sediment to adjacent beaches to offset potential impacts.

Beach volume and shoreline change in the region is also well-documented from the regular beach profile surveys performed by SBPF since 1994. This long-term dataset provides a unique understanding of long-term shoreline evolution both in the proposed Project area, as well as for adjacent beaches. Comparisons between prior data and future post-Project monitoring surveys will provide a strong basis for evaluating Project performance, and identifying potential impacts to adjacent beaches. While not anticipated due to the high level of confidence in the proposed sediment mitigation volume of 12.0 cy/lf/yr, should any adverse impacts be identified, additional sediment mitigation can promptly be provided.

Will there be an escrow account to cover the cost of revetment removal in the event that it fails?

An escrow fund will not be appropriate since there will be an assessable betterment district providing sufficient funding of sacrificial sand to ensure that the revetment will not harm down drift beaches. Similarly, the betterment district will also provide sufficient funding ensure that the revetment will be kept in good repair.

II. CONSTRUCTION

Provide the barge landing area.

The location of the barge landing area will be near the middle of the Project area to minimize transport distances. The precise location will be coordinated with the Conservation Commission at the time of the revetment construction to allow the selection of a site that provides the optimum beach conditions for a barge landing while avoiding impacts to the resource area.

BAXTER ROAD AND SCONSET BLUFF STORM DAMAGE PREVENTION PROJECT
NOTICE OF INTENT

RESPONSES TO COMMENT LETTERS FROM MILONE & MACBROOM DATED AUGUST 2, 2013

August 23, 2013

The following presents SBPF's responses to comments and questions presented by Milone & MacBroom (M&M) in their letter of August 2, 2013. Milone & MacBroom was contracted by the Town of Nantucket to provide technical review of this project. The comments and questions in the letter are presented in underlined text, followed by responses presented in indented text.

There are limited options available for stabilizing this bluff. In our opinion, if hard armoring is to be installed, the plan currently presented by the applicant offers the best solution for this area. Unfortunately, "soft armoring" using only slope stabilization and vegetation techniques would not produce a stable slope and is not a viable long-term solution for this site. While we believe the concepts presented for stabilization and the supporting computations are sound, we offer the following technical comments based on our site observations and review of the application materials provided to date. At this point there is insufficient evidence provided by the applicant to support the proposed design. Until such information is provided, the application is incomplete.

1. The plans were developed based on survey from 2010 and do not reflect existing site conditions. The existing bank in some areas is much steeper than is reflected on the plans. The steepness of the slope would not affect the type of stabilization proposed although there may be areas where the coastal bank is too steep to revegetate with regrading. It is not recommended that the finished revetment slope be any steeper than the proposed 1.5:1.

   Stamped plans based on an updated (2013) LIDAR survey were provided on August 15. A further revision to the plans is attached to this document, where the finished slope revetment has been changed to 2H:1V to increase the stability factor of safety for the coastal structure. While the 1.5H:1V slope is technically valid, the Applicant is proactively adopting a more conservative approach in response to concerns voiced during the previous hearings. Existing sections of bank that exceed this slope will require surface preparation (minor cutting and/or filling) to achieve this maximum slope, as shown on the cross sections of the attached plans.

   The plans presented are for permitting purposes only and are not intended to be suitable for construction. In our opinion, the construction documents should include cross sections of the revetment and slope improvements at 100-foot intervals to more fully detail the proposed activity..

   The updated plans provide a total of seven (7) sections for the shorter revised Project area, these represent four (4) additional cross-sections than the original NOI submission. OCC

intends to prepare additional cross-sections as required for a contractor to execute this work during the construction document preparation phase.

2. Rill erosion and gullies are forming on the bank as a result of stormwater runoff from the top of the bluff. This should be corrected as part of the improvements by diverting the stormwater to a controlled and managed discharge location.

   Re-establishing the vegetation along the upper portion of the bank will reduce most erosion from stormwater runoff. Other, long-term, improvements can be made such as constructing swales along the top of the bluff which will divert stormwater to a controlled discharge location at each end. However, the majority of bank retreat is attributed to storm wave erosion removing the toe of the bank as opposed to top-down erosion from rain. As such, toe protection in the form of a revetment is the primary concern at this time. See also the next response on vegetation plantings.

3. The coastal bank plantings should be specified in detail, and the applicant should take steps to accelerate the rooting of the plantings. This may include installing larger plants and providing irrigation. Stability would be achieved more quickly by incorporating a geogrid-type system. The current design reduces potential environmental impact by not including such a stability system but, if the Conservation Commission were amenable, this additional reinforcement may prove beneficial to the project and increase the likelihood for success.

   As described at the August 8, 2013 Conservation Commission meeting, the Project will utilize jute mats on the face of the bank as part of the vegetation effort; vegetation will be planted through holes in the jute. This approach has been used successfully on the Sconset bank by Baxter Road homeowners and will continue to be used. Beachgrass will be planted first, and after it takes hold and is established, woody vegetation will be planted using the same approach.

   Other types of geogrid system are not recommended for the Project site. Installation of a geogrid system would require significant excavation of the upper portion of the bank, followed by reconstruction of the bank face into terraces reinforced with the geogrid materials. OCC has design experience with these systems and they have required 15 to 18 feet of embedment into the slope for the primary layers. As such, this type of geogrid slope reinforcement system is not recommended for the Project site. The jute mats, however, are recommended for the Project area and do not require embedment.

   We would like the applicant to comment on the need to provide additional lateral stability on the coastal bank to minimize future sloughing.

   Where toe protection has been in place to prevent wave scour at the base of the coastal bank, a combination of jute and coastal bank plantings above the toe protection has effectively prevented the bank from sloughing.

4. The transition from the lower end of the vegetated coastal bluff to the top of the finished revetment stone is inherently an unstable boundary. Sand from the toe, even after vegetation is established, will migrate into the interstitial spaces between the armor stones. This will destabilize the toe of the slope. We would suggest providing a hard "curb" at the top of the revetment to lend stability to the coastal bank above.

   Some revetment designs utilize a concrete wall, "jersey barrier" or other curb structure between the riprap stone and upland interface to prevent migration of upland soils through the riprap. However, we have never seen incorporation of a curb or other barrier in a similar application where the revetment is for toe protection of a bank that continues upslope. The incorporation of a cutoff wall or barrier would require deeper excavation into the slope above the revetment, which would add to concerns of destabilizing the bank during construction. We therefore disagree that a hard curb should be incorporated into the top of the revetment, and believe that vegetation will be sufficient to stabilize the boundary between the bank slope and the revetment

5. The total volume of sacrificial sand needed for the proposed construction should be provided and equated to truck trips. This information should be broken into Phases 1 and 2.

   Truck trip information was presented at the July 30, 2013 hearing and is updated below based on the revised bank volume contribution. The revised bank volume contribution is discussed in the document entitled "Supplemental Responses to Questions from Nantucket Conservation Commission Asked at Public Hearing on August 8, 2013" dated August 23, 2013. Additionally, the Project will now be constructed in a single season in 2014, so breaking down the information into Phases 1 and 2 is no longer required.

   Annual Sediment Mitigation. *Approximately 40,800 cy of sediment will be required for annual sediment mitigation (12.0 cy/lf * 3,400 feet). Assuming 20 cy dump trucks, a total of approximately 2,040 truck trips will be required. Assuming 6-10 dump trucks working on a daily basis (each dump truck making 10 trips/day), the full volume of sediment could be delivered in 21-34 days. It is proposed that the annual sediment mitigation amount be delivered during two separate phases (each 10-17 days) in the early spring and late fall. Based on the results of the monitoring, the dates of sediment delivery could be adjusted to deliver more or less sediment prior or subsequent to the winter storm season.*

6. As with past work in the area, sand will be brought to the top of the bluff and transported to the bottom using a conveyor system. Trucks on the beach will transport the material to the specific work location. The applicant should comment on the stability of the bluff at the access locations and its ability to support the delivery trucks.

   During review of the marine mattress and gabion project, Haley & Aldrich evaluated whether the proposed access locations could support the loading associated with a crane.

Haley & Aldrich recommended that the crane be positioned to be completely behind a 35 degree sloped line projecting up from the toe of the slope (at beach level), extending upwards to intercept the Access Roadway. Using the profile data from 2010, Haley & Aldrich determined that the 35 degree sloped line would intersect the top of the bank approximately 40 feet landward of the edge of the coastal bank at the accessway proposed at that time. Therefore, Haley & Aldrich recommended a 40 foot setback from the top-of-slope.

While the weight of the crane is significantly greater than the weight of dump trucks, the same recommendation from Haley & Aldrich to position equipment completely behind a 35 degree sloped line projecting up from the toe of the slope to the top of the bank can be implemented. Using the 2013 survey data, a 35 degree sloped line projecting up from the toe of the bank to where it intercepts the top of the bank was drawn on a section view of the lot closest to each of the five proposed accessways, and the distance between the edge of the coastal bank and the 35 degree sloped line was measured. This distance is the recommended setback distance. The below table lists both the recommended setback distances for each pullover location and the distances between the edge of the coastal bank and the truck pullover location. In all instances the truck pullover location is located landward of the recommended setback distance (with a minimum setback distance of 50 feet from the top of the bank), indicating that the truck pullover locations will not impair bank stability.

Table 1. Recommended Setback Distances for Truck Pullover Locations

Pullover Location (Baxter Road)	Distance from Seaward Pullover Edge to Top of Bank (ft)	Recommended Setback Distance[1] to Top of Bank (ft)
119	80	27.5
113-109	72	16.5
101-99	50	14.5
87-85	72	16.7
63-61	144	0

1. Recommended setback distance is based on the difference between the current edge of coastal bank and the location where a theoretical 35 degree slope starting at the toe of the coastal bank intercepts the top of the coastal bank. For those lots with a recommended distance of "0," no setback is required because the existing bank profile is equal to or less than 35 degrees.

7. The proposed plans call for a crest width at the top of the revetment of approximately 10 feet. The U.S. Army Corps of Engineers, Coastal Engineering Manual (CEM), EM 1110-2-1100, August 2008 (Change 2) provides design guidance for beach fills and suggests that a crest width greater than 10 feet may be more appropriate. In general, a more detailed

assessment of the beach fill volume and geometry is strongly encouraged so as to maximize the potential for success of the proposed filling.

The sand at the top of the revetment was not intended to act as a beach fill as described in the CEM as referenced. However, we no longer plan to provide the initial sand fill on top of the revetment, rather we will spread the mitigation sand in front of the revetment to form a sacrificial sand berm covering the toe stones, and along areas adjacent to the revetment approximately 300 feet to each side of the revetment.

8. Sacrificial sand is proposed at a slope of 2H:1V to limit intrusion into the beach. A shallower slope would likely be more stable. As noted above, the CEM provides significant guidance for beach fill design. The optimum slope is dependent on the native beach sand gradation, the proposed fill material characteristics, beach morphology, and related environmental conditions The applicant is proposing the relatively steep slope so as to minimize beach intrusion. Appropriate optimization of the fill shape can be realized with the application of proper model simulation, SBEACH, BMAP, etc.

   The sand is not intended as a beach fill in the traditional sense. It is proposed as a sacrificial berm at the back of the beach to keep sand in the littoral system. We no longer plan to provide the initial sand fill on top of the revetment, rather we will spread the mitigation sand on top of the revetment toe and along areas adjacent to the revetment approximately 300 feet to each side of the revetment. The revised plans show the slope of the berm will be 3H:1V.

9. We did not receive any information regarding the gradation of the existing beach or of the sacrificial sand. Is it the applicant's intent to match the existing beach gradation or use a coarser material?

   The Applicant plans to use bank-compatible sand from an island pit. The compatibility of the island pits to the native coastal bank sediments was exhaustively demonstrated during the marine mattress and gabion project and is repeated below.

   Grain size compatibility between the proposed borrow sites (Reis and/or Holdgate pits) and the coastal bank and coastal beach was assessed using both a comparison of grain sizes and the Overfill Factor analysis. A comparison of mean grain sizes between samples from both pits and Sconset bluff and beach indicates that both proposed pit sources are bank- and beach-compatible sediments. (See October 20, 2011 letter from Dr. Peter Rosen in Attachment 1.)

   Sediment compatibility between the island pits and native coastal bank is further demonstrated by the Overfill Factor analysis. The Overfill Factor calculation is the approach that is cited in MassDEP's guidance document for Best Management Practices for

Beach Nourishment Projects (MassDEP (2007).[1] This approach is also described in the Shore Protection Manual (USACE, 1985)[2].

The Overfill Factor (RA) was developed by James (1975)[3] and estimates the stability of borrow site sediment on the beach under the assumption that the existing beach sediment is stable. The result is a factor that predicts the percentage of sediment that may be lost, since part of the grain size population may be finer sands. The resulting factor suggests how much sediment should be placed on the beach to provide the equivalent of one cubic meter of sediment. This factor requires calculation of the mean grain size and sorting for the borrow source and the "beach" (in this case, the bank since the mitigation sediment is meant to replicate the volume of sediment contributed from the coastal bank). The borrow site to "beach" sorting ratio is then compared the mean diameter of the grain size distribution for the borrow source minus the mean for the "beach" divided by the sorting for the borrow site. (Details of the calculation can be found in Attachment 2.)

The Overfill Factor Analysis for the coastal bank indicates that to replicate the amount of beach-compatible sediment eroded from the coastal bank, ***no overfill factor is required*** *when using either the Reis or Holdgate pit. This reflects the fact that with 13% fines in the natural bank material, the material from both pits is more stable than the coastal bank material, i.e., the* R_A *value is* < 1.0.

10. The proposed revetment stone will range in size from 1.5 feet to 4.5 feet in diameter based on the significant wave design criteria and the proposed revetment geometry. This design makes no account for potential scour at the toe of the structure. Such scour will, effectively, increase the design water depth and subsequently the stone gradation. We recommend that the applicant consider the effects of scour as a part of the design approach. This will likely result in modifying the stone gradation to include larger top-sized stone and increasing the size of the smaller stone elements. This would appear to be a relatively easy revision of the ACES revetment design module.

    The plans submitted on August 15 contain a revised, "Dutch toe" design based on US Army Corps guidance for moderate to severe scour potential sites in which the depth below grade and the width is based on the design wave height. Further, determination of the incident wave height considered an initial amount of scour. The Corps recommendation for scour depth and toe design is based on the design wave height. Current design practice does not call for re-assessing the project design wave for the deeper water depth after assumed

[1] MassDEP, 2007. Beach Nourishment: MassDEP's Guide to Best Management Practices for Projects in Massachusetts. 31 pages.
[2] U.S. Army Corps of Engineers (USACE), 1984. Shore Protection Manual, 4th edition, 2-part set, U.S. Government Printing Office, Wash., D.C.
[3] James, J.R. 1975. *Techniques in Evaluating Suitability of Borrow Material for Beach Nourishment*. Technical Memorandum No. 60, Coastal Engineering Research Center, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

scour has occurred, as this would result in an infinite loop that does not realistically approximate actual scour processes that are observed in the field. The latest revisions to the plans have narrowed the specification of the armor stone size, such that larger pieces will be more prevalent. The minimum stone size will now be 3 ft nominal dimension, ranging to a maximum of 4.5 ft (i.e. 2 to 7 tons with an average size of 3.5-4 tons).

11. The proposed design does not seem to address the potential for wave action and flanking at the terminal ends of the revetment structure. This potential exists around the isolated revetment sections following completion of Phase 1,as well as around the ends of the completed continuous structure following completion of the entire project. Since Phase 1 will consist of discontinuous armoring at the locations identified as being in imminent danger of failure, flanking may occur in a number of locations during the interim period between Phase 1 and Phase 2. The applicant should address both the interim condition and the final condition and provide details for how this condition will be prevented.

    The Applicant has provided additional detail on the topic of flanking at the July 30 ConCom hearing. The revetment ends will be tapered and covered with sand mitigation to prevent flanking and end scour. These areas will be monitored after coastal storms to determine if flanking is occurring and if so, mitigative sand will be applied to remedy the problem.

12. Application materials indicate that stone will be barged to the site. A temporary landing barge will be run ashore and grounded using spuds, and rock will be moved from transport barges, transferred to the landing barge, and then transported to the beach. As noted previously, sand will be trucked to the delivery location to the work area in question. The applicant should clarify what environmental impacts, if any, would result from this proposed truck movement on the beach.

    Sediment will be positioned by a front-end loader or skid steer working on the beach. This vehicle movement is not anticipated to have any significant environmental impact, especially since there is no mapped habitat within the Project area.

13. Failure of the bank during work seems to be a real possibility. The applicant should comment on this and explain how the existing bank will be stabilized during excavation for the toe of the revetment.

    The contractor will be responsible for maintaining safe excavations at the worksite, including providing temporary shoring as required during the performance of the work. We addressed this same concern during the previous proposed gabion mattress project, and provided figures illustrating the typical use of timber or steel sheeting and/or trench boxes for temporary shoring.

14. The applicant has stated that the town cannot stabilize Baxter Road within its right-of-way and that the armoring is needed not just for private property but for the public good as well.

We also understand that the Board of Selectmen, in entering into the Memorandum of Understanding with the applicant, has made a determination that the stabilization of the bank in necessary to protect Baxter Road and the associated public infrastructure. While it is our opinion that if hard armoring is proposed the project as presented by the applicant is the best solution for protecting Baxter Road, there may be other alternatives for the stabilization of Baxter Road that should be evaluated. For example, driving steel sheeting along the edge of the right-of-way may be feasible for the short term (i.e. five to 10 years) of stability.

To stabilize the road for truck loads and heavy emergency vehicles, the steel sheeting may need to be anchored. This would require additional excavation or drilling under the existing road to install. This would only be a temporary solution since the bank supporting the sheeting would continue to erode rapidly away, destabilizing the toe of the sheeting. Thus, the feasibility of this method even for the short term is questionable. Further, even if the sheeting were to work on a temporary basis, once the toe of the bluff is further undermined and migrates landward, the ability to protect the bluff from erosion will have been lost making the relocation of the roadway unavoidable. This approach is only a method for providing added time to arrange for an alternative access route and forces the retreat and relocation of existing homes and roadway.

Attachment 1

GEO/PLAN ASSOCIATES

30 MANN STREET
HINGHAM, MASSACHUSETTS 02043-1316
Voice & Fax: (781) 740-1340
Email: GeoPlanAssoc@gmail.com

October 20, 2011

Epsilon Associates
P.O. Box 700
Maynard, Massachusetts 01754-0700

Attention: Mr. Les Smith

Re: Sediment Compatibility Analysis, Siasconset Beach

Dear Mr. Smith:

I performed size analyses of composite sediment samples from two sand pits from Nantucket in October, 2011. The purpose of this letter is to evaluate the suitability of these pit sediment sources as mitigation sediment for a segment of beach along Siasconset Beach, Nantucket. The project area is within previously-identified sampling sites designated as sediment sampling transects (Line 15 through Line 19). Extensive sediment sampling of the area (beach, bank, dune) was performed in 2006 along these lines and adjacent areas by Coastal Planning and Engineering, Inc. Other grain size data from this beach area is available from earlier sampling in 1998, 2001 and 2003. Some of these samples I collected and analyzed.

The composite or mean sizes are compiled below for comparison. While the methodologies for analysis are consistent, the reporting of the data, the lateral extent of the sampling along Siasconset Beach, and the field sampling methods may vary. This doesn't affect the documentation of the sand characteristics, and that the resulting time-series provides a measure of variability of the natural sands over time. These mean sizes and other characteristics are compiled below.

A. Proposed Pit Sediment Sources:

Holdgate Partners Mean: 0.57 phi (coarse sand)
88% sand 12% gravel
(most gravel granules or finer; <4mm); mud (insignificant)

Myles Reis Pit Mean –0.07 phi (very coarse sand)
83% sand 17% gravel
(most gravel fine pebbles or finer; <8mm); mud (insignificant)

B. Natural Bank Sediments

2001: 2 phi, (medium - fine sand) includes 8% mud
2003: 1.8 phi (medium sand) includes 5.5% pebbles or granules
2006: 0.45 phi (coarse sand) includes minor fine pebbles/granules

The bank sediments vary between medium-fine sand to coarse sand, and contain varying amounts of fine gravel and mud. Direct observation of this coastal bank has shown that, although dominantly sand, there is frequently a mud and gravel component and periodically mud layers and clay banks are part of the deposit. The fine or coarse tails and the variation in sizes are typical for glacial outwash sediments in this setting.

C. Beach Sediments

1998: 1.5 phi (medium sand)
2001: 1.0 phi (medium – coarse sand)
2003: 0.9 phi (coarse sand)
2006: 0.7 phi (coarse sand) [Line 15 – Line 19]

The more recent 2006 samples are coarser than the earlier samples, either due to natural variation in sand sizes over time, or any cyclic changes relating to energy. Regardless of the cause, these four sampling intervals indicate that the natural sediment on the beach is not coarser than the 0.7 phi 2006 samples.

D. Discussion

Compatible beach sediment is not sand that exactly matches the existing beach, but rather sediment that is stable and can coexist with the naturally deposited sediment in the coastal setting. If the compatibility of the sediment is evaluated relative to potential stability on the beach (which is generally the case), **compatible sediment is equal or coarser than the existing sediment**.

Both of the proposed source areas are also glacial outwash sediments. Both samples have insignificant mud (<1%), which is a plus for compatibility, as mud is quickly lost, and is the most common aesthetic and water turbidity objection. Both of the proposed source areas are geologically the same material (outwash sediments) from the same vicinity as the natural bank materials. Both samples contain gravel. While the gravel does not match surface beach sediment samples, small gravel is a visible component on these beaches and shallow nearshore. Importantly, both samples are coarse sand, which has the greatest likelihood of remaining stable on the Siasconset Beach. While the sizes are reported as means, there are ranges of sizes finer and coarser in all samples. However, both the natural beach sediment and both potential pit sources have very small amounts of sand finer that medium sand. This is the component of the sand that is most likely to be quickly lost from the beach. Therefore, the wave sorting will likely re-sort nourishment sand to have comparable sizes to existing conditions, or coarser, so most of the source material will have as great a probability of remaining within the adjacent beach system as the natural bank material.

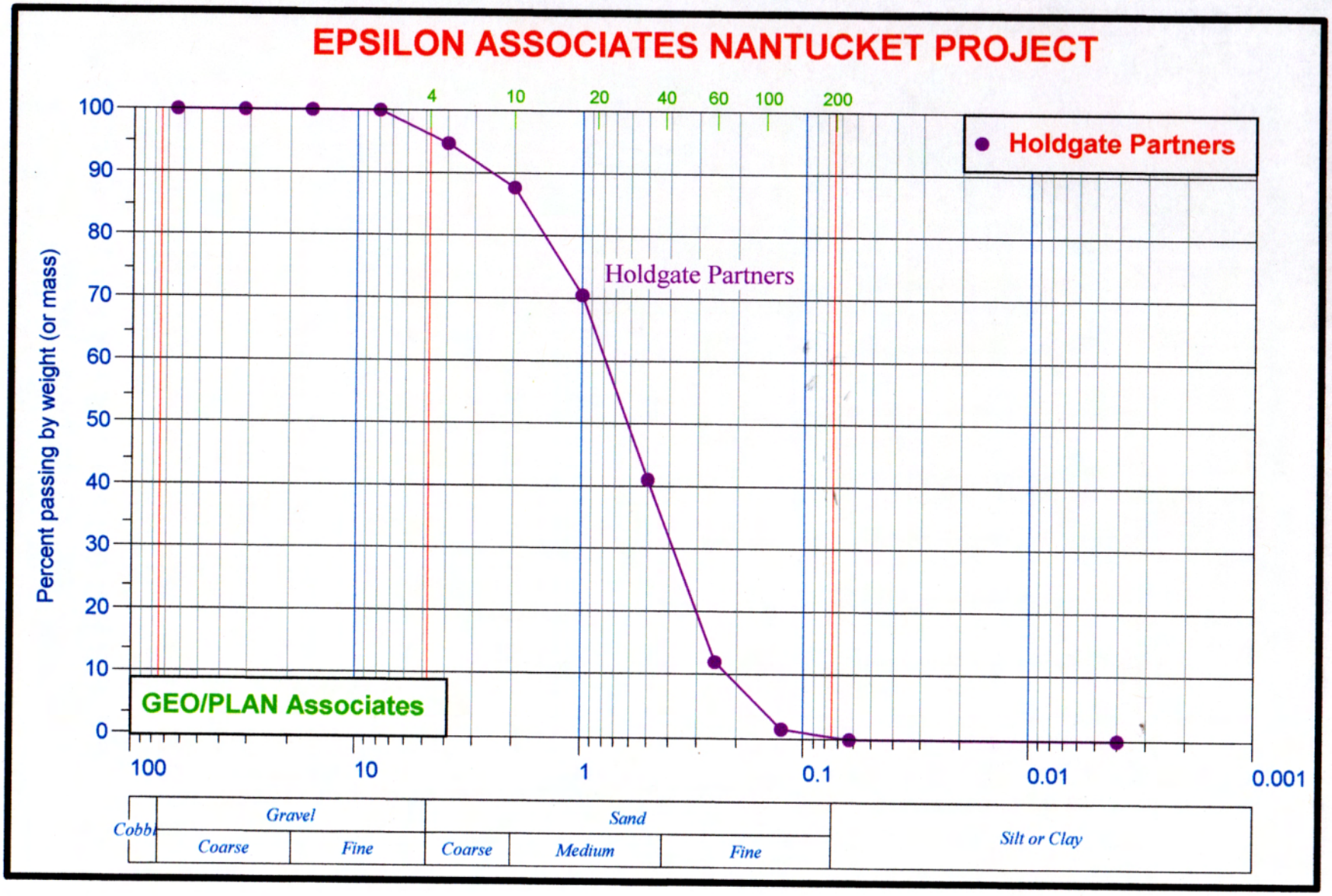
Both source pits sediment samples are slightly coarser than both the natural bank and the existing beach sediments. Much of the variation in mean size is due to the differences in gravel content. The differences in gravel content, however, are not significant. Grain size is measured by weight, which is affected by gravel greater than if it were measured by volume, which is how sediment is specified for mitigation purposes. Therefore, both proposed source pit sediments are beach-compatible sediments.

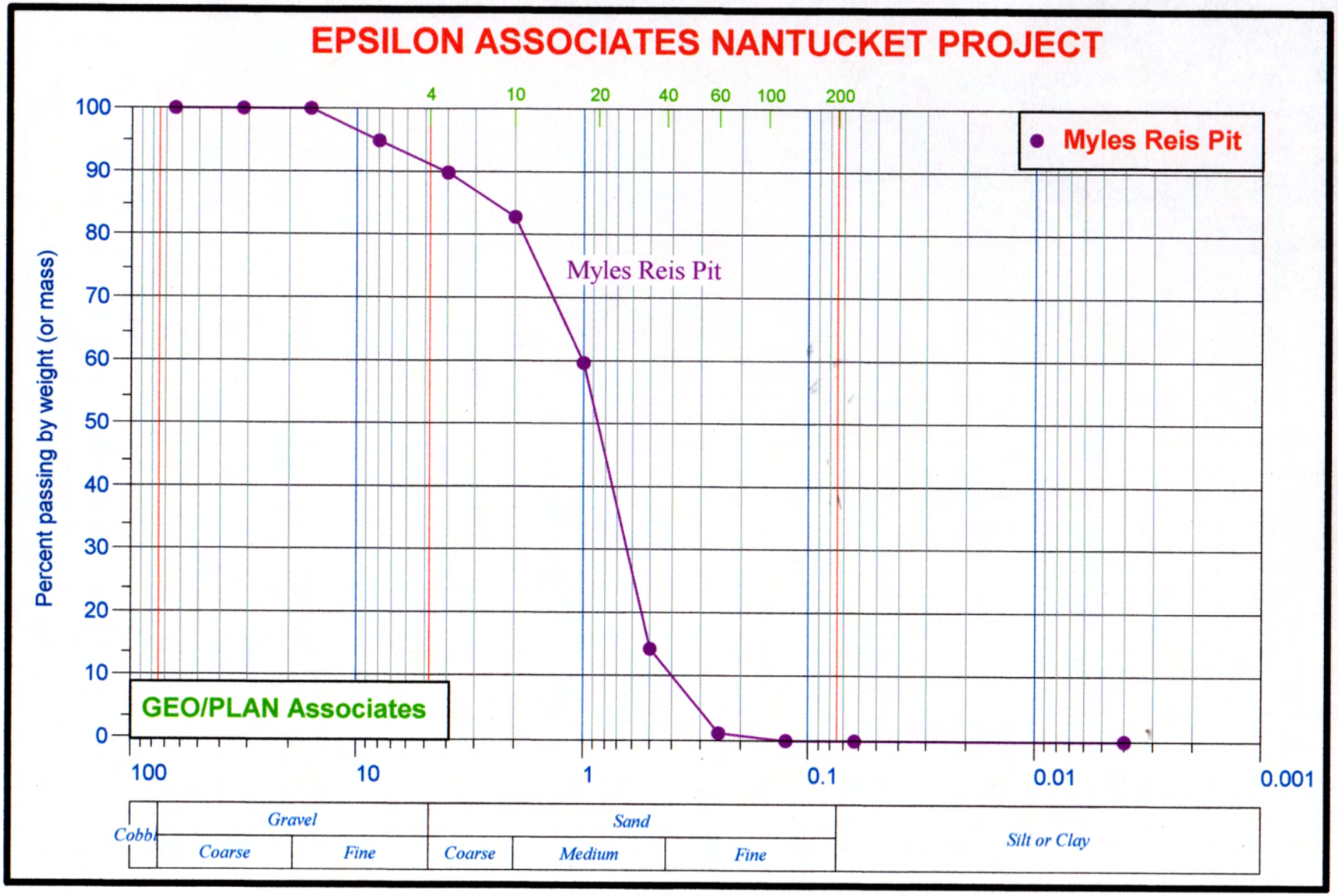
Please feel free to contact me if there are further questions concerning the evaluation of these sand samples.

Yours truly,

Peter S. Rosen, Ph. D.

Coastal Geologist


EPSILON ASSOCIATES NANTUCKET PROJECT
Percent passing by weight (or mass)
100
90
80
70
60
50
40
30
20
10
0
4
10
20
40
60
100
200
Holdgate Partners
Holdgate Partners
GEO/PLAN Associates
100
10
1
0.1
0.01
0.001
Cobbl
Gravel
Coarse
Fine
Sand
Coarse
Medium
Fine
Silt or Clay


EPSILON ASSOCIATES NANTUCKET PROJECT
Myles Reis Pit
Myles Reis Pit
GEO/PLAN Associates
Percent passing by weight (or mass)
100
90
80
70
60
50
40
30
20
10
0
4
10
20
40
60
100
200
100
10
1
0.1
0.01
0.001
Cobbl
Gravel
Coarse
Fine
Sand
Coarse
Medium
Fine
Silt or Clay

GEO/PLAN Associates
Sediment Grain Size Analysis
Client:Epsilon Associates
Project: Nantucket, MA
Project Location: Nantucket, MA
Project No.
Date: October 2011

Sample: **Holdgate Partners**

Phi	Cum Wt	Total Wt	% Wt	Cum %	Sand Only	
					% Wt	Cum %
>-5	0.00	0.00	0.00	0.00	0.00	0.00
-4	0.00	0.00	0.00	0.00	0.00	0.00
-3	0.00	0.00	0.00	0.00	0.00	0.00
-2	6.51	6.51	5.43	5.43	5.43	5.43
-1	14.87	8.36	6.97	12.40	6.97	12.40
0	35.37	20.50	17.10	29.50	17.10	29.50
1	70.62	35.25	29.39	58.89	29.39	58.89
2	105.38	34.76	28.99	87.88	28.99	87.88
3	118.26	12.88	10.74	98.62	10.74	98.62
4	119.91	1.66	1.38	100.00	1.38	100.00

Phi	Total Wt	Bkr Wt	Corr. Wt	Wt Frac	% Wt	Bk No.
Silt	0.0000	0.0000	0.0000	0.0000	0.0000	--
Clay	0.0000	0.0000	0.0000	0.0000	0.0000	--
		Disp. Wt	0.0000			

Wt. Coarse	119.9100
Wt Fine	0.0000
Total Wt	119.9100

Phi	Wt %	Phi Mid Pt	Wt % Mid Pt	Mid pt - Mean (=X)	X sq	X sq Wt %
>-5	0.00	-5.50	0.00	-6.07	36.88	0.00
-4	0.00	-4.50	0.00	-5.07	25.73	0.00
-3	0.00	-3.50	0.00	-4.07	16.59	0.00
-2	5.43	-2.50	-13.57	-3.07	9.44	51.26
-1	6.97	-1.50	-10.46	-2.07	4.30	29.96
0	17.10	-0.50	-8.55	-1.07	1.15	19.68
1	29.39	0.50	14.70	-0.07	0.01	0.16
2	28.99	1.50	43.48	0.93	0.86	24.92
3	10.74	2.50	26.85	1.93	3.71	39.89
4	1.38	3.50	4.83	2.93	8.57	11.83
Silt	0.00	6.00	0.00	5.43	29.45	0.00
Clay	0.00	9.00	0.00	8.43	71.02	0.00
TOTAL	100.00		57.28			177.69

Total Sample		Mean =	0.57	Variance =	1.78
				Sample SD =	1.33
Coarse Only	100.00		57.28		177.69
		Mean =	0.57	Variance =	1.78
				Sample SD =	1.33

Gravel	Sand	Silt	Clay	Total
12.4	87.6	0.0	0.0	100.0

Sand	Silt	Clay	Total
100.0	0.0	0.0	100.0

GEO/PLAN Associates
Sediment Grain Size Analysis
Client:Epsilon Associates
Project: Nantucket, MA
Project Location: Nantucket, MA
Project No.
Date: October 2011

Sample: **Myles Reis Pit**

Phi	Cum Wt	Total Wt	% Wt	Cum %	Sand Only	
					% Wt	Cum %
>-5	0.00	0.00	0.00	0.00	0.00	0.00
-4	0.00	0.00	0.00	0.00	0.00	0.00
-3	5.91	5.91	5.05	5.05	5.05	5.05
-2	12.01	6.11	5.22	10.27	5.22	10.27
-1	20.16	8.15	6.97	17.24	6.97	17.24
0	47.07	26.92	23.02	40.25	23.02	40.25
1	100.01	52.94	45.27	85.53	45.27	85.53
2	115.54	15.53	13.28	98.81	13.28	98.81
3	116.91	1.37	1.17	99.98	1.17	99.98
4	116.93	0.03	0.02	100.00	0.02	100.00

Phi	Total Wt	Bkr Wt	Corr. Wt	Wt Frac	% Wt	Bk No.
Silt	0.0000	0.0000	0.0000	0.0000	0.0000	--
Clay	0.0000	0.0000	0.0000	0.0000	0.0000	--
		Disp. Wt	0.0000			

Wt. Coarse	116.9300
Wt Fine	0.0000
Total Wt	116.9300

Phi	Wt %	Phi Mid Pt	Wt % Mid Pt	Mid pt - Mean (=X)	X sq	X sq Wt %
>-5	0.00	-5.50	0.00	-5.43	29.47	0.00
-4	0.00	-4.50	0.00	-4.43	19.61	0.00
-3	5.05	-3.50	-17.68	-3.43	11.76	59.37
-2	5.22	-2.50	-13.05	-2.43	5.90	30.80
-1	6.97	-1.50	-10.45	-1.43	2.04	14.22
0	23.02	-0.50	-11.51	-0.43	0.18	4.23
1	45.27	0.50	22.64	0.57	0.33	14.78
2	13.28	1.50	19.92	1.57	2.47	32.78
3	1.17	2.50	2.93	2.57	6.61	7.75
4	0.02	3.50	0.07	3.57	12.75	0.27
Silt	0.00	6.00	0.00	6.07	36.86	0.00
Clay	0.00	9.00	0.00	9.07	82.29	0.00
TOTAL	100.00		-7.13			164.19

Total Sample		Mean =	-0.07	Variance =	1.64
				Sample SD =	1.28
Coarse Only	100.00		-7.13		164.19
		Mean =	-0.07	Variance =	1.64
				Sample SD =	1.28

Gravel	Sand	Silt	Clay	Total
17.2	82.8	0.0	0.0	100.0

Sand	Silt	Clay	Total
100.0	0.0	0.0	100.0

Attachment 2

GEO/PLAN ASSOCIATES

30 MANN STREET
HINGHAM, MASSACHUSETTS 02043-1316
Voice & Fax: (781) 740-1340
Email: GeoPlanAssoc@gmail.com

January 17, 2012

Ms. Maria Hartnett
Epsilon Associates
3 Clock Tower Place
Suite 260
Maynard, MA

Re: Beach Grain Size and Nourishment Calculations
Sconset, Nantucket, MA

Dear Maria:

The attached data table compiles grain size data for sediment samples from two Nantucket sand pits, Holdgate and Reis; and available coastal bank grain size data. From the coastal bank data, a composite of samples from of1998 – 2006 was calculated.

Using these data, the method of James (1974) was used to estimate the residence time, stability of source sediment on beaches. Two parameters were calculated, Overfill factor R_A and Renourishment Factor R_J. In this case, the sand pit data was compared to the natural composite beach characteristics, and the sand pit data was compared to the coastal bank. The purposed of the latter calculation was to estimate how the sand pit data compared to the natural bank sand source in terms of ultimate stability of the beach.

Please feel free to contact me if you have any further questions.

Yours truly,

Peter S. Rosen, Ph. D.
Coastal Geologist

Sconset Beach
James Parameters: Borrow area to beach compatibility and borrow area to bank comparison

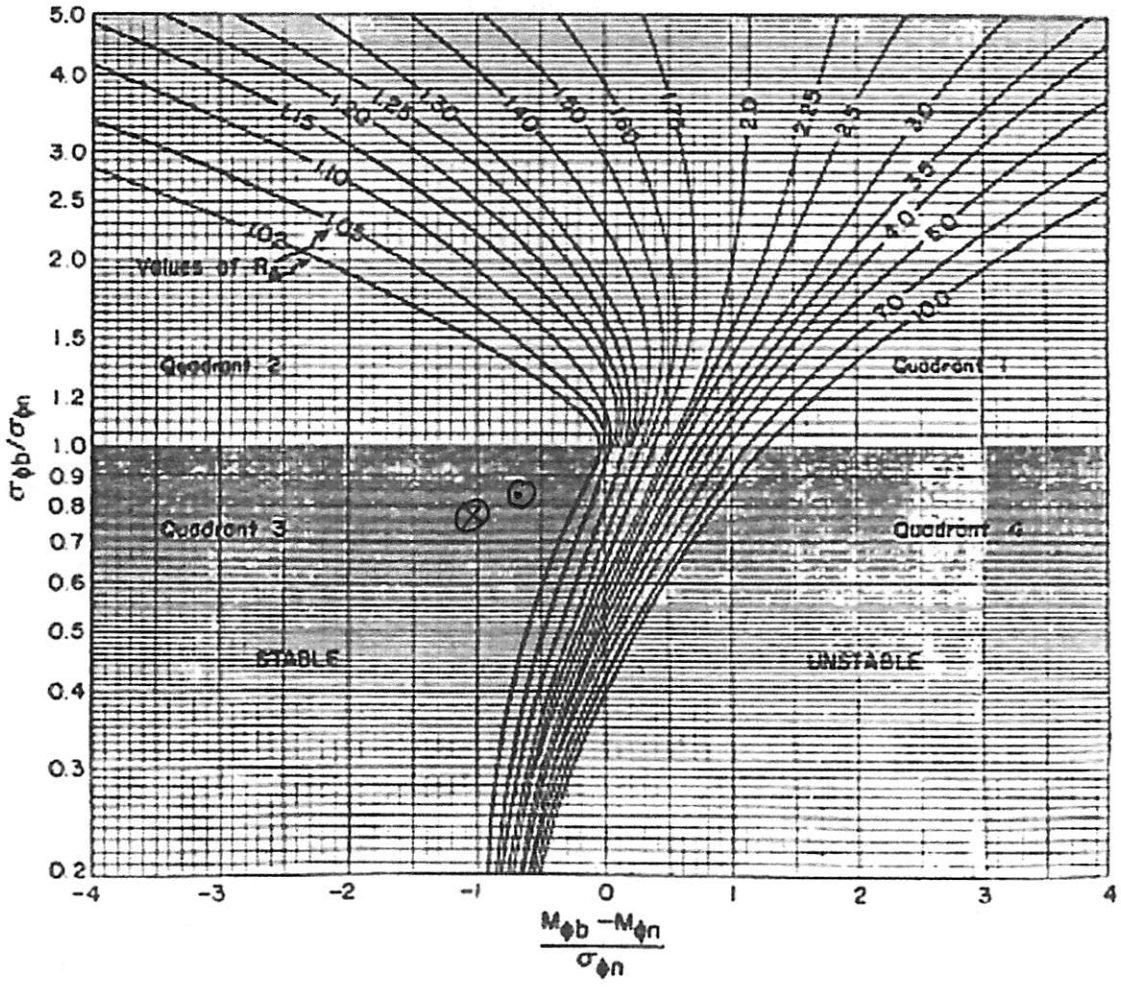
Cases Borrow area:	Beach:	sd borrow/ sd beach	mean borrow-mean beach/ sd beach	Overfill Factor (RA)	Renourishment Factor (RJ)
Holdgate	98- 06 Beach composite	2.66	-0.52	1.32	1/25
Reis	98- 06 Beach composite	2.56	-1.80	1.1	1/30
Composite	98- 06 Beach composite	2.62	-1.16	1.17	1/30
Holdgate	98-06 Composite Bank	0.83	-0.64	<1	1/2
Reis	98-06 Composite Bank	0.80	1.04	<1	2/3

Holdgate Pit		
	mean	0.57
	sd	1.33
Reis Pit		
	mean	-0.07
	sd	1.28
Pit Composite		
	mean	0.25
	sd	1.31
Bank Composite		
2006 L15 - L18 Bank Composite (qv)		
	Mean	1.18
	SD	1.29
2003 Bank Composite		
	mean	1.83
	SD	1.73
1998 Bank Composite		
	mean	1.76
	sd	1.79
1998 to 2006 Bank Composite		
	mean	1.59
	sd	1.6

2003 Sconset Coastal Bank Samples

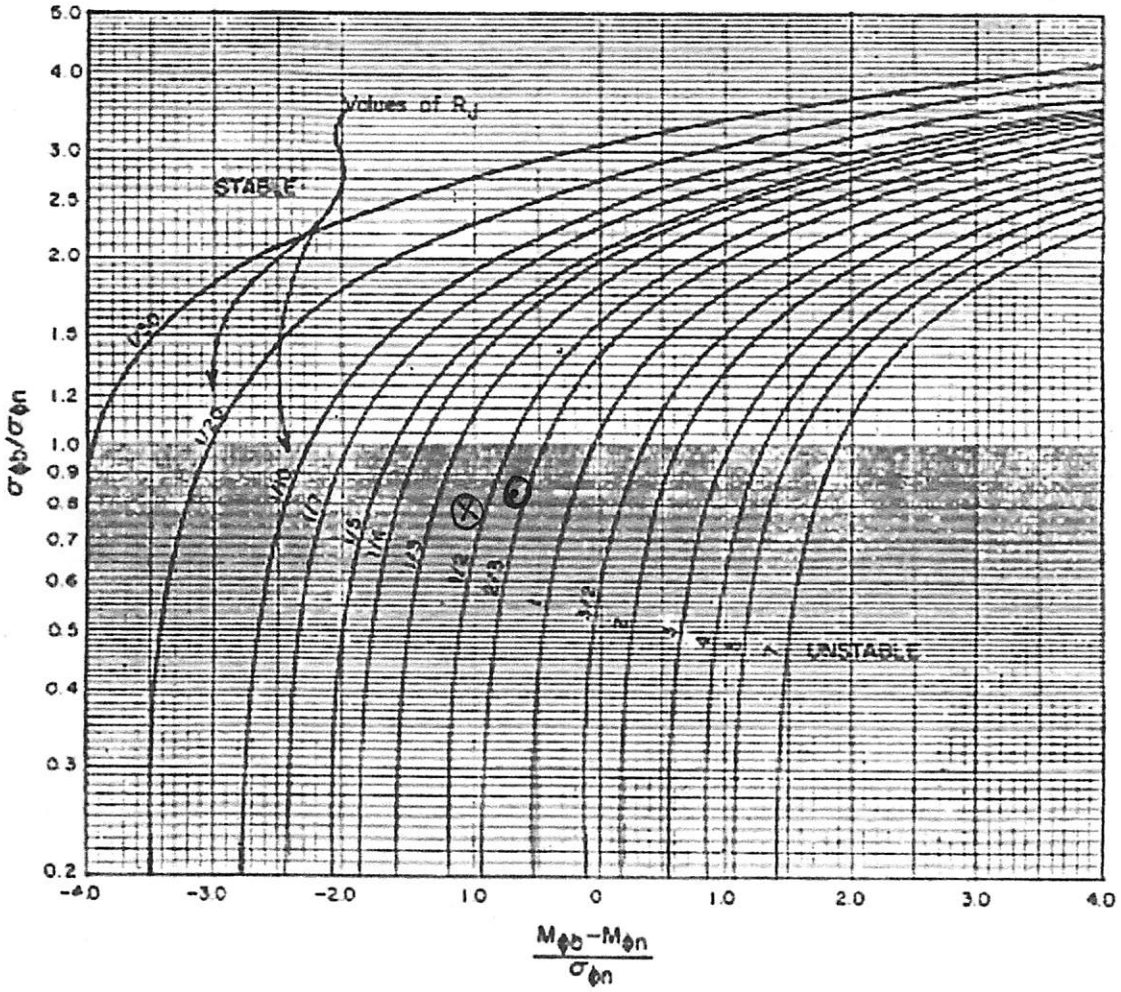
Sample ID	Mean	St Dev
90.6-1	1.44	1.00
90.6-2	3.20	2.48
90.6-3	1.67	1.46
90.6-4	0.79	1.24
91.5-1	1.62	2.25
91.5-2	1.73	2.67
91.5-3	2.14	2.20
91.5-4	2.09	1.78
92.5-1	2.64	0.92
92.5-2	1.17	1.73
92.5-3	1.88	1.37
92.5-4	2.42	1.35
93.5-1	2.30	1.82
93.5-2	1.61	1.90
93.5-3	1.18	1.78
93.5.4	1.40	1.77
n=16		
total	29.28	27.72
composite mean	1.83	1.73

JAMES OVERFILL FACTOR (R_A)
"BEACH:" 98-06 BANK COMPOSITE



SOURCE: ⊙ HOLDGATE
⊗ REIS

JAMES RENOURISHMENT FACTOR (R_J)
"BEACH:" 98-06 BANK COMPOSITE



SOURCE: ⊙ HOUDGATE

⊗ REES

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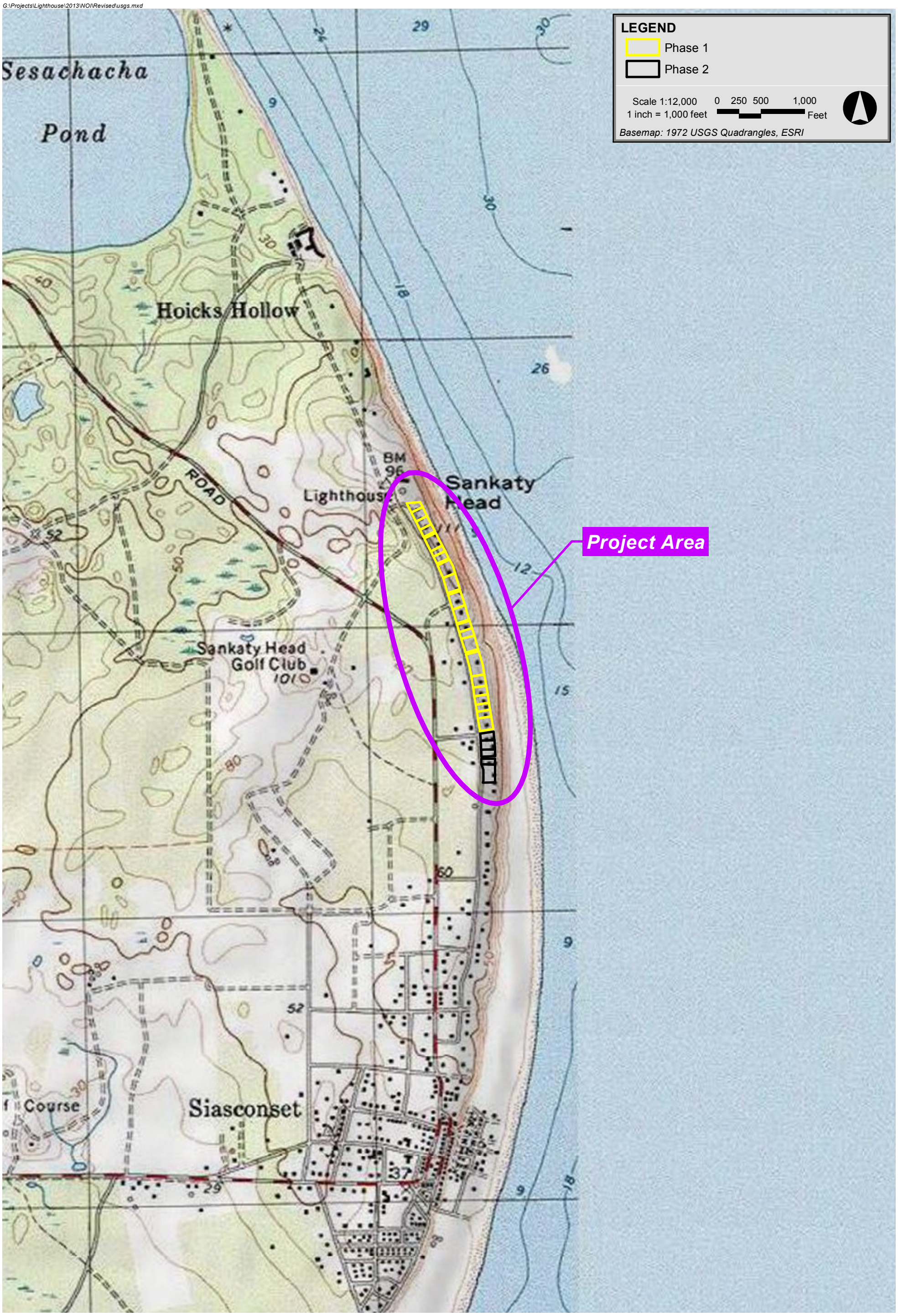

Baxter Road and Sconset Bluff Storm Damage Prevention Project **Nantucket, MA**

Figure 1
USGS Locus

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Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, MA

Figure 2
Aerial Locus

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Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, MA

Figure 7

Wetland Resource Areas

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Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, MA

Figure 9

Natural Heritage and Endangered Species Program